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ABSTRACT

This publication utilizes a quick card file format in providing teacher developed and classroom tested environmental education lessons and units for students, K-12. Each 5x8 inch card provides the teacher with the following information: grade level, area of study, concept, purpose, activities, and evaluation. The goal of this format is to give the teacher a complete environmental education program within fingertip reach. The lessons are interdisciplinary in nature and relate to some aspect of environmental education such as sensory awareness, living things, conservation of resources, and natural and social communities. (MA)

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MAN IN HIS WORLD

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SE 022 977

STATEMENT OF PHILOSOPHY

MAN is the dominant organism on the Earth and can, through technological manipulations of the environment, control most of its condition and consequence. No matter where man lives, the environment is a crucial and significant factor in determining the quality of his individual and collective life.[1]

Because MAN lives in surrounding natural, social, and human environments of his life space - - environmental education should be a total look at where man lives, how he lives, and why he lives. Environmental education is not a single subject - - but a synthesis of all school disciplines, understandings, and skills. Teachers use both the natural and man-made environments to help teach art, language arts, mathematics, music, physical education, the sciences, and social studies - - to help students understand the relationship(s) among those subjects, the environment, and MAN.

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October 1977

[1] Reference to Man and His Environment, Association of Classroom Teachers, National Education Association, Washington, DC, 1970.

MAN IN HIS WORLD CARD FILE FORMAT

This complete MAN IN HIS WORLD teacher resource QUICK CARD file, as developed by the NIE funded Experimental Schools (ES) project in New Hampshire School Supervisory Union 58, consists of teacher developed and classroom tested environmental education lessons and units for Kindergarten through grade twelve. Each lesson and/or unit has been reproduced on 5x8 inch cards - - thus providing the individual classroom teacher with a complete 'how to do it' environmental education program at fingertip reach.

Each environmental education lesson and/or unit relates some aspect of environmental education (e.g., sensory awareness, living things, natural and social communities, conservation of resources) to the several subject matter areas of the curriculum and emphasizes exposure to, the development of, and the application of subject matter skills in the total process of environmental awareness, exposure, and exploration.

The New Hampshire School Supervisory Union 58 Experimental Schools project was funded by The National Institute of Education (Washington, DC) from July 1973 through June 1978. This research and development (R+D) project, one of ten such ES projects funded nationwide, was charged with instructional program development, implementation, documentation, evaluation, and revision in environmental education.

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October 1977

AREA OF STUDY: SENSES (Science) GRADE RANGE: Kindergarten

CONCEPT: Senses of sight, hearing, touching, and smelling - as well as tasting

PURPOSE: To develop student awareness of the outdoors by using one's senses.

ACTIVITIES:

1. Take a walk in the woods. Encourage students to listen, look, touch, and smell the things about them.
2. After the walk - make an experience chart with the following headings:
   We Saw ...
   We Heard ...
   We Felt ...
   We Smelled ...
   We Tasted ...
3. Students discuss and write descriptive words about each experience chart related sensory experience.
4. Using the experience chart headings - each student draws pictures of things they saw, heard, felt, smelled, and tasted.
5. Students conduct a tasting party with different types of food. Each student is blindfolded and asked to identify different types of food solely by their smell(s).

EVALUATION:

1. Students make sense booklets using pictures from magazines to visually describe each sense.
2. Students make a bulletin board which depicts the things they saw, heard, felt, smelled, and tasted while on their awareness/exposure walk.
3. Using a teacher-made flannel board students associate pictures of things and the sense with which they are most-often identified.

AREA OF STUDY: SHAPES AND FORMS (art, mathematics, and science) GRADE RANGE: K-1

CONCEPT: Geometric forms (in natural and man-made structures)

PURPOSE: To develop student sensory awareness of geometric forms that appear in the total life space.

ACTIVITIES:

1. Introduce the four basic geometric forms to students
   - circle
   - rectangle
   - square
   - triangle
2. Students are taken on a 'shape walk' into the local community for purposes of identifying basic geometric shapes. They are involved in:
   - identifying the shape of small natural things (e.g., flowers, grass, leaves, stones, and twigs of trees)
   - identifying the shape of large natural things (e.g., contours of the land, clouds, and trees)
   - identifying the shape of man-made objects (e.g., buildings, fences, signs)
3. Each student draws pictures of the several shapes they found on their excursion into the community
4. In the classroom - students repeat their 'shape walk' activity - - this time identifying basic geometric forms found indoors

EVALUATION:

1. Students make a shape book -- recording their drawings in a document.
2. Students make a scrapbook of pictures representing the four basic geometric forms studied.
3. Students make a collage using representations of the four basic shapes.
4. Using a teacher-made flannel board students associate different natural and man-made objects with the four basic geometric shapes.

AREA OF STUDY: SOCIAL ENVIRONMENTS (social studies) GRADE RANGE: K-1

CONCEPT: The family as a social unit

PURPOSE: To acquaint students with the purpose(s) and structure of the FAMILY - - as a social institution.

ACTIVITIES:

1. What is a family? A discussion of the services provided the individual member of a family -- by the family in total.
2. The family has a new baby. Discussion of each family member's job(s) when a new member is added to the family.
3. A day with the family. Students talk about activities and trips that their families have been engaged in.
4. Family fun. Students talk about their family fun activities and draw pictures to represent these events.
5. Students draw pictures of family member's jobs and roles.
6. Students role play family members. This activity can be video taped and played back for the class.
7. Students learn and use vocabulary words (e.g., work, role, function, family, job).

EVALUATION:

1. Students make a bulletin board depicting the various functions of the family unit.
2. Using a teacher-made flannel board students associate family unit jobs with specific family members.

AREA OF STUDY: TREES (science) GRADE RANGE: K-1

CONCEPT: Seasonal changes in plants

PURPOSE: Students observe the complete seasonal cycle of a tree during the school year.

ACTIVITIES:

1. The teacher reads the following riddle to the class:

> "Can you guess? What starts from something smaller than a bee, and soon gets bigger than you and me? What's bare in winter, and bright in fall, and makes shade in summer, for one and all? What do boys like to climb, and girls do, too? And gives many good things to me and you? A tree, of course!"

2. Students are taken on a walk into the woods and adopt a tree. They draw pictures of the tree and collect descriptive data.

3. During the course of the school year - during each season - the students visit the adopted tree and note changes in its appearance and structure. Slides and visuals (such as video tapes and drawings) can be made to depict the changes in the tree from season to season.

4. The following activities can be conducted by the students during the different seasons of the year.

   . FALL - water the tree during dry periods
   . WINTER - leaves and grass cuttings are placed around the trunk of the tree
   . CHRISTMAS - a bird feeder is placed on the tree

EVALUATION:

1. Students write stories about their adopted tree.

2. Using visual aides students make a visual record of the tree -- from season to season.

3. Students discuss the changes in the tree -- from season to season.

AREA OF STUDY: LIVING THINGS (science) GRADE RANGE: K-2

CONCEPT: Living things respond to their environment(s)

PURPOSE: Students understand that each living thing has requirements which must be met through interaction with its environment.

ACTIVITIES:

1. Plan with the students to go on a treasure hunt -- a walk around the school yard to look for 'treasures'. Students should look for:

. rocks	. grasshoppers
. worms	. sticks
. leaves	. feathers
. ants	. bugs
. flowers	. moss

2. After the treasure hunt - students put their treasures on a table - sort them out - and display their found items. Treasures are categorized as living or non-living. ALL LIVING THINGS MUST BE PROPERLY TAKEN CARE OF by students as soon as they return to the classroom.

EVALUATION:

1. Students discuss the living and non-living treasures they found.
2. Students make collections of like treasures and display them for classmates.

AREA OF STUDY: SENSORY AWARENESS OF THE ENVIRONMENT (science, social studies, language arts)

CONCEPT: The nature of one's surroundings GRADE RANGE: K-12

PURPOSE: To acquaint students with the nature of the surrounding natural and social environments of the life space.

ACTIVITIES:

1. Students are taken out into the surrounding life space environment(s) to gather information. They quietly experience their surroundings. Using graphic media devices (e.g., motion picture cameras, still cameras, video tape cameras) students record those things sensed.
2. Students draw pictures of the environmental phenomena sensed.
3. Students take notes of their experiences.
4. Back in the classroom - students discuss their outdoor experiences.

EVALUATION:

1. Students make bulletin boards using their drawings and graphic visuals.
2. Students discuss their experiences and impressions.
3. Students discuss the interrelationships between themselves and the surrounding environment(s).

AREA OF STUDY: ENERGY AND RECYCLING (science, social studies, art) GRADE RANGE: 1

CONCEPT: Conservation of natural resources

PURPOSE: To identify the ways energy is used: what we use, reuse, save, and waste.

ACTIVITIES:

1. Students find out how their homes are heated and what they use energy for in the home.
2. Students list all the appliances used in the home.
3. Students discuss the types of appliances (creature comforts) that are necessary and those that a family could do without.
4. Students keep a record of the appliances used in the home for a period of one week. They attempt to estimate the cost of those appliances -- electrical cost for usage.
5. Students make posters for energy conservation.
6. Students make collages using magazine cut-outs and use them for bulletin board displays.
7. Each student makes a conservation of energy booklet.
8. Students investigate and discuss alternative energy sources.
9. Students visit a nearby power plant and learn about electrical energy production and distribution to users.
10. Students make art projects using scraps -- stressing the reusability of discarded items.

EVALUATION:

1. Students discuss the 'pros-and-cons' of alternative energy sources.
2. Students conduct a mock energy saving campaign.
3. Students discuss the energy usage of different appliances.

AREA OF STUDY: LOCAL BIRDS (science) GRADE RANGE: 1

CONCEPT: Characteristics of species

PURPOSE: Students learn to identify individual birds by the various characteristics of their species.

ACTIVITIES:

1. Students are taken on a nature walk field trip to observe birds in their natural settings. Students use binoculars to get close-up views.
2. Students look for feathers and nests.
3. Students create an outdoor bird feeding station and observe the feeding habits of different birds.
4. Students discuss how birds eat and take care of themselves.
5. Students draw pictures of the different birds they observed.
6. Guest speakers discuss birds: their ways-of-life -- complete with visuals.
7. What are some of the enemies of birds? Students research this topic and make a bulletin board display.
8. Students listen to recorded bird calls. They discuss the tape/records later.

EVALUATION:

1. Students match pictures of birds and their eggs.
2. Students match feathers with their types of birds.
3. Students name five favorite foods of birds.
4. Students identify predators of birds.

AREA OF STUDY: PLANTS AND ANIMALS (science and art) GRADE RANGE: 1

CONCEPT: Natural communities

PURPOSE: To develop student knowledge of and about an ant colony culture: how ants live and work.

ACTIVITIES:

1. Students help to set up an ant colony in the classroom. They discuss ants: their ways-of-life and different types of ants.
2. Students observe ant behavior in the ant farm.
3. Students measure the distance traveled by an ant in the ant farm.
4. Using magnifying glasses - students study the physical structure of an ant.
5. Students discuss their understandings of ants.

EVALUATION:

1. Students discuss different kinds of ants.
2. Students discuss the different types of food eaten by ants.
3. What are some ant habits?
4. Students discuss how ants are beneficial to MAN.

AREA OF STUDY: EARLY SPRING FLOWERS (science) GRADE RANGE: 1-3

CONCEPT: Habitats

PURPOSE: Students are able to identify the common spring flowers and plants of the local area.

ACTIVITIES:

1. Students are introduced to flowering and non-flowering plants of the local area.
2. Students are introduced to the different parts of a flower -- using wall charts and ditto master copies.
3. Students are taken on a nature walk field trip to discover different types of plants and flowers.
4. Students collect sample plants - bring them back to the classroom - and plant them in a terrarium.
5. Students draw pictures of plants and flowers discovered on the field trip walk.

EVALUATION:

1. Students make a bulletin board display of their plant/flower drawings.
2. Using a teacher-made flannel board - students associate the names of plant parts with a diagram of a plant. The same exercise is used to identify flower parts.
3. Students make a flower/plant scrapbook of magazine pictures and drawings.
4. Students care for the plants in the classroom terrarium.

AREA OF STUDY: ENVIRONMENTAL EDUCATION (science and social studies) GRADE RANGE: 1-3

CONCEPT: Time - History

PURPOSE: To acquaint students with different times in history of the Earth - prehistoric.

ACTIVITIES:

1. What was the Earth like before MAN? Students are involved in a discussion of this question.
2. What were dinosaurs? What did they look like? Students are shown films or filmstrips of dinosaurs and discuss the topic after viewing the visuals.
3. Why did the dinosaurs die out? Discussion of the topic. Students research the topic to find the answer(s).
4. What changes have taken place on the Earth since the time of the dinosaurs?
5. What was the Great Ice Age? Students research and discuss the topic.

EVALUATION:

1. Students make a table top diarama of a prehistoric scene -- complete with dinosaurs.
2. Students draw pictures of different types of dinosaurs and discuss them.
3. Students make a bulletin board depicting different types of dinosaurs.
4. Students report on 'monster' stories such as Locke Ness.

AREA OF STUDY: TREES (language arts, science) GRADE RANGE: 1-3

CONCEPT: Characteristics of species

PURPOSE: Students are able to identify trees in their immediate areas by their general characteristics

ACTIVITIES:

1. Students take a nature walk and collect specimens from trees (e.g., leaves, cones, bark, twigs).
2. Students make rubbings of tree bark.
3. Students study the rings of a tree stump or cutting to determine the approximate age of a selected tree(s).
4. Students take photos of trees during different times of the year - in order to determine seasonal changes.
5. Students write stories and poems about trees.
6. Students keep growth charts and activity logs.
7. Students make leaf prints and collect leaves in scrapbooks.
8. Students learn the different parts of a tree and investigate the edible parts of a tree.
9. Students plant young trees and care for them.
10. Guest speakers (foresters) discuss the life cycle of trees and their conservation management/harvesting/use by man.

EVALUATION:

1. Students paste pieces of a tree on heavy cardboard and identify the different parts.
2. Students make a bulletin board of their tree drawings.
3. Students develop oral reports about various types of local area trees.

AREA OF STUDY: A CLEAN ENVIRONMENT (language arts, science, and social studies)

CONCEPT: Litter in the community GRADE RANGE: 2

PURPOSE: To develop student awareness of why trash cans are placed in certain areas and their proper use.

ACTIVITIES:

1. Students take a walk around the school yard and the community to identify locations of trash cans. Later they discuss the location of the several cans - and their proper usage.
2. Guest speakers discuss the need for litter disposal containers and why people should use them.
3. Students conduct a community survey of available trash cans and determine the need/location for additional trash cans. Letters can be written to the town government proposing the location of new trash cans.
4. Students tour the local dump, landfill, or other system of trash disposal. They take pictures/draw pictures of the disposal system visited.
5. Students investigate the topic: recycling of discarded materials.

EVALUATION:

1. Students undertake class projects re: suggesting new disposal systems.
2. Students develop reports re: recycling of discarded materials and waste materials.
3. Students make clean-up posters and bulletin boards.

AREA OF STUDY: A CLEAN ENVIRONMENT (art, science, and social studies)

CONCEPT: Waste materials GRADE RANGE: 2-8

PURPOSE: To develop student awareness of the efficiency of the solid waste disposal system.

ACTIVITIES:

1. Guest speakers discuss the purpose and operation of a solid waste system.
2. Students take a field trip to a solid waste disposal plant and learn about the operation of the process.
3. Students take pictures/draw pictures of the facility and discuss its operation in class - following the trip.

EVALUATION:

1. Students discuss the operation process of a treatment/disposal plant.
2. Students develop a scrapbook of factual data re: disposal systems.
3. Students ask researched questions of guest speakers.

AREA OF STUDY: POND LIFE (language arts and science) GRADE RANGE: 2-6

CONCEPT: Living things respond to their environment(s)

PURPOSE: To develop student awareness of snails as being the major consumers in a balanced aquarium.

ACTIVITIES:

1. Students do research reports re: what and how do snails eat? how do snails move? how do snails get oxygen? how and where do snails lay their eggs?
2. Students make an aquarium complete with snails. They observe the behavior and habits of the snails in the aquarium. Information is recorded in logs and graphically.
3. Students observe the motion of a snail's foot. They also observe the snail's tongue.
4. What kinds of plants do snails favor?
5. Students observe the egg masses of snails. They magnify and count the eggs in the clusters.

EVALUATION:

1. Students make reports on their observations of snails.
2. Display charts and bulletin boards are made which depict and explain the behaviors and habits of snails.
3. Students keep logs of their observations and activities re: snails.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (art) GRADE RANGE: 2-6

CONCEPT: Beauty can be found anywhere.

PURPOSE: To teach students how to perceive beauty in the natural environment.

ACTIVITIES:

1. Students go into a natural setting and collect leaves, twigs, and weeds having different formations.
2. Students are introduced to the process of making rubbings of each item collected.
3. Each student chooses a rubbing of one particular item collected and develops it further by use of pencils or crayons -- making a scene wherein the rubbing serves as a background to figures or creatures in action.

EVALUATION:

1. Each student studies his/her own work and evaluates it.
2. Students critique each other's work -- explaining what they like and don't like about each drawing.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (language arts) GRADE RANGE: 2-6

CONCEPT: The practice of good listening

PURPOSE: To incorporate listening and responding skills into environmental education.

ACTIVITIES:

1. Students take a short walk into a wooded area. Once there they follow hand signals and begin to develop awareness via listening.
2. Periodically students sit down and close both their eyes and fists -- and lsiten to the sounds (or lack of sounds) about them. Each time a different sound is heard the students raise one finger.
3. Following the listening exercises the students discuss the sounds that they have heard.
4. Students can take along cassette recorders and record the sounds of the natural environment. These tapes can be played back at a later time and discussed.

EVALUATION:

1. Student participation in field trip activities.
2. Student discussions of field trip experiences.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (language arts) GRADE RANGE: 2-6

CONCEPT: Reference skills

PURPOSE: To develop student awareness of the uses of various research/reference skills in the natural environment(s).

ACTIVITIES:

1. Students take a trip into the woods and identify the general characteristics of flowers, birds, trees, and animals.
2. Each student searches for flowers, birds, trees, and animals which match the general characteristics of species.
3. Students research their field based studies using reference sources from the classroom, the school, and the home. Reports can be developed.
4. Students can draw pictures of the species of flowers, birds, trees, and animals found on the field trip.

EVALUATION:

1. Student reports.
2. Displays.
3. Each student can identify some characteristic of a given flower, bird, tree, and/or animal.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (language arts) GRADE RANGE: 2-4

CONCEPT: Vocabulary development

PURPOSE: To reinforce the concepts of nouns, verbs, adjectives -- the development of vocabulary in natural settings.

ACTIVITIES:

1. Students take a walk in the woods and record the sounds heard on cassette recorders. Later, students orally describe the sounds heard and recorded.

2. Using a list of appropriate adjectives -- students find objects in the woods to which the adjectives can be applied.

3. Each student makes a collection of descriptive words and keeps a card file.

4. Each student must categorize their natural environment observations by color, size, shape, and texture.

EVALUATION:

1. Observation of student field based activities.

2. Student discussions and descriptions of natural phenomena experienced.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, mathematics, science, and social studies)

CONCEPT: Living things respond to their environment(s). GRADE RANGE: 4-10

PURPOSE: To acquaint students with differing geographical regions and to explore the adaptation of life to surrounding environments.

ACTIVITIES:

1. Students research the several natural characteristics of the Earth. How can these characteristics be used for recreation? to support life? Are climates and geographical regions related? What are some of the regions of the Earth?

2. Students are introduced to life in the desert. What are some of the characteristics of a desert region? What are some of the problems of sustaining life in a desert?

3. Students discuss and research the characteristics of some animals, reptiles, and plants that exist in a desert region. How have various types of life adapted to the desert environment?

4. Life in a pond is discussed and researched. Students can be shown films and filmstrips. Students compare and contrast forms of life that live in the soil, in a stream, and in a pond. Field trips can be taken to each of the three site types studied. How do these forms of life differ from those found in the desert?

5. Students draw maps of the world and locate different regions on them.

6. Using cameras, students record the natural characteristics of the local region. Later, these visuals can be shown and discussed.

7. Using maps of the United States, students outline domestic desert regions.

8. Students are introduced to several new vocabulary words related to the topic of study.

- climates
- regions
- adapt
- desert
- plant eaters
- meat eaters
- forest soil
- grassland soil
- desert soil
- temperature

EVALUATION:

1. Students develop research reports.
2. Student map work.
3. Observation of field activities and studies.

AREA OF STUDY: POND LIFE (science) GRADE RANGE: 2-6

CONCEPT: Cohabitation in a pond habitat.

PURPOSE: To develop student understandings of a simple balance in nature -- how plants and animals live together in a pond habitat.

ACTIVITIES:

1. Students take a field trip to a pond. They collect pond water and life samples.
2. Back in the classroom water and pond life samples are placed into a tank -- to be studied later.
3. Students wait for the aquarium to become balanced (about two weeks) and then begin their observations and studies.
4. Students conduct research using reference sources and visuals.

EVALUATION:

1. Observation of student activities.
2. Student care of the aquarium.
3. Student reports.

AREA OF STUDY: SOCIAL ENVIRONMENTS (social studies) GRADE RANGE: 2-6

CONCEPT: Different cultures have different social environments.

PURPOSE: To acquaint students with where people live and their lifestyles.

ACTIVITIES:

1. Students select two human cultures and compare their lifestyles -- similarities and differences.
2. Students are introduced to the fact that irregardless of the location or lifestyle -- all human beings need the basics of life: food, clothing, shelter, water, air. How do people living in different regions meet these needs?
3. Students compare lifestyles of a rural and urban community. What are some similarities and differences?
4. Students draw pictures depicting human lifestyles in different regions of the world.
5. Guest speakers who have traveled to/lived in different parts of the world discuss lifestyles and cultures.
6. Students role play the lifestyles of people from around the world. Costumes can be made.
7. Students learn and use vocabluary words related to the topic of study.
   - ecology
   - ecosystems
   - environment
   - human community
   - interdependence
   - community
   - lifestyles
   - culture

EVALUATION:

1. Student projects and activities.
2. Use of vocabulary words.
3. Student research reports.

AREA OF STUDY: WATER AND ITS USE (mathematics, science, and social studies)

CONCEPT: Conservation of natural resources GRADE RANGE: 2-6

PURPOSE: To develop student understanding of how we can conserve our water supplies.

ACTIVITIES:

1. Each student in the class keeps a daily chart of the amounts of water consumed daily:
   - brushing teeth
   - showers/baths
   - flushing toilet
   - drinking water
   - washing hair

2. Students investigate their local community to determine the sources of greatest water consumption (e.g., factories, mills, homes, treatment plants). They attempt to estimate the amount of water consumption (in gallons) per year.

3. Students start a water conservation campaign in the classroom. Each student plans how to conserve on water consumption at home. Diaries and logs can be kept.

4. Guest speakers discuss water conservation projects in the local area and water consumption problems - water sources - etc.

EVALUATION:

1. Observation of student activities and projects.
2. Diaries and logs
3. Questions asked guest speakers.

AREA OF STUDY: AIR POLLUTION (science and social studies) GRADE RANGE: 3-6

CONCEPT: Conservation of natural resources

PURPOSE: Students develop an awareness and understanding of the car pollution problem and pollution effects on our natural resources and environment(s) -- as well as on human health.

ACTIVITIES:

1. Guest speakers discuss the problem of car pollution in the local community and the effects of pollution on human health.

2. Students are shown films and filmstrips which depict car pollution problems in urban centers. A class discussion can follow.

3. Students discuss how poor car exhaust systems can pollute the air. What is being done to correct this/these problem(s) in late model cars? Students can research this question and make reports.

4. Students can conduct a local community research project. They can go out into the community and observe the volume of car traffic and some of the pollution problems that exist. Reports can be given to the class and discussed.

5. Students can visit local car dealerships and inquire as to air pollution devices and standards. They can be shown pollution control devices at the sites.

EVALUATION:

1. Observation of student activities.
2. Pollution control/problem reports.
3. Research projects.

AREA OF STUDY: CITY LIFE (art, language arts, and social studies) GRADE RANGE: 3-4

CONCEPT: Man-made environments

PURPOSE: To develop student awareness of the character of a city environment.

ACTIVITIES:

1. Students plan a trip to a nearby city. They use maps to familiarize themselves with the city. Films and filmstrips can be shown to acquaint students with a typical city and its ways-of-life.

2. Guest speakers can discuss city life and the character of a city.

3. Students take a guided field trip to a city and visit points-of-interest. Still and motion pictures can be taken.

4. After the trip - students discuss their experiences. Reports can be developed.

5. Students make a table top diarama of a city. They build scale model buildings, construct streets, etc. They discuss and explain why the city is developed - as it is.

EVALUATION:

1. Observation of field trip activities and student involvement.

2. Model city planning and development.

3. Visuals of the city visited.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (art and science) GRADE RANGE: 3-6

CONCEPT: The individuality (uniqueness) of designs found in nature.

PURPOSE: To acquaint students with the unique characteristics of like objects.

ACTIVITIES:

1. Students are taken out into a natural setting and collect flowers, leaves, twigs, and weeds with different growth patterns. The physical characteristics of each flower, leave, twig, and weed is pointed out to students.

2. Each student spreads rubber cement onto cardboard and when the compound is tacky the collected items are arranged and pressed onto the cardboard.

3. When collections are dry - each student rolls ink over the objects and paper is placed on the inked objects and rubbed -- being careful not to move the paper. This process results in a print.

4. Each student studies his/her prints -- to determine similarities and differences.

EVALUATION:

1. Students evaluate their own prints.

2. Students critique each other's work.

3. Students study the items collected and discuss their structure and features.

AREA OF STUDY: MAN-MADE INVENTIONS (mathematics, science, and social studies)

CONCEPT: Graphing GRADE RANGE: 3-6

PURPOSE: Graphing enables students to see the amounts of different types of cars in use today - locally.

ACTIVITIES:

1. Each student constructs a graph which will show the number of cars that pass by a certain location: the size (compact or large), the make, the year, and the color.

2. Students go out into the community (to certain locations) and observe passing traffic - to determine the size, the make, the year(s), and the color of cars.

3. In the classroom - students discuss their observations. Graphs are used in the discussion(s).

4. Students are involved in a discussion re: are cars used for pleasure or survival? Can humans limit the use of cars? What are some alternative sources of human transportation - in the local area?

5. Guest speakers discuss the topic: automobile transportation re: sales, parking facilities, pollution, congestion, etc.

EVALUATION:

1. Student project(s).

2. Student discussions and questions asked of guest speakers.

3. Student graphs and analysis of data.

AREA OF STUDY: CONSERVATION EDUCATION (art, science, and social studies)

CONCEPT: Earth's resources are generally finite. GRADE RANGE: 3-6

PURPOSE: To acquaint students with the need to conserve natural resources.

ACTIVITIES:

1. Guest speakers discuss the topic: conservation of natural resources re: local resources.
2. Students are shown films/filmstrips re: the conservation of natural resources.
3. Guest speakers discuss the topic: reforestation. What is it? How does reforestation help the local natural resources? the local economy?
4. Students discuss: what ways does nature keep its natural environment alive? How does recycling help keep a natural environment alive? What is a balanced environment? How is environmental imbalance harmful?
5. Students select conservation topics and research them. Each student develops a research report -- complete with visuals -- re: a local natural resource.

EVALUATION:

1. Student reports.
2. Student collections of local natural resources.
3. Proper use of learned vocabulary words.

. ecology . predator
. recycle . consumption of resources
. finite . pollution

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (art, language arts, and science)

CONCEPT: Every tree has its own character but people's perceptions of it vary.

PURPOSE: To observe - study - and record the growth pattern of a tree GRADE RANGE: 4-6

ACTIVITIES:

1. Students are taken out into a natural wooded area to observe and to study trees. Students discuss the number of branches on given trees and the geometric patterns of trees.
2. A given tree is selected and each student draws his/her impression of the same tree.
3. Students looks at each other's drawings and discuss why each drawing of the same tree is different.

EVALUATION:

1. Students discuss the similarities/differences between their drawings of the given tree.
2. Students research the topic: trees and develop reports.
3. Student leaf collections.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, language arts, science, and social studies)

CONCEPT: Characteristics of species GRADE RANGE: 4-6

PURPOSE: To acquaint students with diverse animal and plant life -- by species.

ACTIVITIES:

1. Students research and discuss the question: what plants can be found in a desert environment? How do these plants live? How do animals adapt to life in a desert environment? What are some of the animal's characteristics?

2. Students are introduced to a desert environment via films or filmstrips. After viewing the films/filmstrips -- students are involved in discussions.

3. Each student selects a desert region of the world and develops a class report -- complete with visuals.

4. Guest speakers who have lived in - traveled to desert regions discuss the nature and character of desert environments.

5. Students make a simulated desert environment in a terrarium.

6. Students collect/draw pictures of desert animals.

7. Each student selects a desert animal and develops a class report -- complete with visuals.

8. Students are introduced to a series of vocabulary words related to the topic of study.

. oasis	. fossil	. cactus
. evaporation	. dune	. protective coloration
. mimicry	. resin	. water hole

EVALUATION:

1. Student activities and projects.
2. Student reports.
3. Questions asked guest speakers.

AREA OF STUDY: CONSERVATION AND SENSORY AWARENESS (art) GRADE RANGE: 4-6

CONCEPT: Discarded materials can be recycled into objects of aesthetic beauty.

PURPOSE: To teach students to see the creative possibilities in 'junk' or discarded objects.

ACTIVITIES:

1. Students collect discarded objects (e.g., bottles, cans, plastic goods).
2. Each student selects one discarded item collected and studies it for its 'character'.
3. Each students plans a decoration that will enhance or bring out the character of the item selected for study.
4. Using paint, yarn, tissue paper, etc. -- each student decorates his/her item/object.

EVALUATION:

1. Each student critiques his/her work.
2. Students critique each other's work.

AREA OF STUDY: CONSERVATION/OUTDOOR EDUCATION (art. language arts, science, and social studies)

CONCEPT: Natural resources can be used and enjoyed. GRADE RANGE: 4-6

PURPOSE: To acquaint students with the fact that natural resources can be used for recreational purposes and can be enjoyed year-around.

ACTIVITIES:

1. Students are introduced to the topic: ecosystem(s). What are producers? Consumers? Decomposers? How do they interact to serve succession and nature's balance? What is a food chain?
2. Guest speakers discuss natural resources of the local area -- and how they can be used for recreation and enjoyment.
3. Students organize a weekend outing club. Club members are taken on one-day excursions (daytrips) into natural areas or on overnight camping-hiking trips -- to enjoy natural resources.
4. Students debate the topic: natural resources should not be used for recreational purposes by the general public.
5. Students select local recreation businesses and develop reports for class presentation -- complete with visuals.
6. What are some of the natural resources of the area -- and how are they being used presently? Students investigate this question.
7. Students develop reports re: a food chain.

EVALUATION:

1. Student activities and reports.
2. Bulletin board displays depicting food chains.
3. Questions asked guest speakers.
4. Student produced visuals re: local natural resources and their usage.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, science, and social studies) GRADE RANGE: 4-6

CONCEPT: MAN's environments and the natural environment(s) are often in direct competition for natural resources.

PURPOSE: All living things are dependent upon natural resources for daily existence and long-range survival.

ACTIVITIES:

1. In what ways has MAN adapted to his environment(s) and changed his environment(s)? Students discuss and research this question.
2. What was the Industrial Revolution? How did it effect natural environments? How did it effect MAN's ways-of-life? Students discuss and research these questions.
3. In what ways has MAN's intrusion into natural environments helped/hurt these areas? What effect(s) does MAN's population have upon NATURAL environments? Students discuss and research these questions.
4. What is supply? Demand? and Balancing supply and demand? Students discuss and research these questions?
5. Students identify the natural resources of the local area and investigate their use/misuse re: the local economy. What inhabitants of the local natural environment(s) are dependent upon these resources?
6. Guest speakers discuss MAN's relationship(s) with local natural environments.

EVALUATION:

1. Student activities and projects/reports.
2. Questions asked guest speakers.
3. Teacher-made quizzes and tests.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, science, and social studies) GRADE RANGE: 4-6

CONCEPT: MAN's environments and the natural environment(s) are often in direct competition for natural resources.

PURPOSE: All living things are dependent upon the natural resources for daily existence and long-range survival.

ACTIVITIES:

1. What resources of nature are in greatest demand by MAN -- locally, regionally, nationally, and world-wide? Students discuss and research these questions.

2. What are some of MAN's basic needs? How does the environment(s) effect MAN's getting these needs achieved? Students discuss and research these questions.

3. Guest speakers discuss how MAN's basic needs are met locally -- from the natural environment(s).

4. Students investigate how MAN uses local natural resources.

EVALUATION:

1. Student activities and reports/projects.

2. Questions asked guest speakers.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, science, and social studies) GRADE RANGE: 4-6

CONCEPT: MAN's environments and natural environments are often in direct competition for natural resources.

PURPOSE: All living things are dependent upon the natural resources for daily existence and long-range survival.

ACTIVITIES:

1. Using graphic media devices students collect data re: local use/misuse of natural resources.

2. Students take field trips to sites which use natural resources to determine what jobs are dependent upon natural resources utilization.

3. Students conduct a local land-use study. They go out into the local community (natural, social, and human environments) in order to determine current use practices and to recommend future use patterns.

4. What natural resource conservation programs exist locally? Students discuss and research this question.

5. Guest speakers discuss the topic: local use/misuse of natural resources.

EVALUATION:

1. Student activities and reports/projects.
2. Questions asked guest speakers.
3. Teacher-made quizzes and tests.
4. Student visual data collection processes -- and results.

AREA OF STUDY: OUTDOOR EDUCATION (language arts, science, and social studies) GRADE RANGE: 5-6

CONCEPT: Concern for the natural environment should be coupled with its recreational use.

PURPOSE: To acquaint students with the beauty and character of different part of the United States.

ACTIVITIES:

1. Students are introduced to the several different parts of the nation via films/filmstrips.
   - Atlantic Coastal Plain
   - Great Central Basin
   - Pacific Coastal Plain

2. Students research each section of the nation and draw maps. Each section of the nation is marked on the maps. A color code can be used.

3. Guest speakers who have traveled to/lived in the different sections of the nation discuss the characteristics of these sections with students. Available visuals can be used by guest speakers.

4. Students discuss and research each section of the nation and develop reports. They then discuss the following questions.
   - What characteristics of the Atlantic Coastal Plain and the Great Central Basin are alike?
   - How does the natural environment and geography of a given area effect one's way-of-life? Economics? Transportation?
   - What characteristics of the Atlantic Coastal Plain and the Pacific Coastal Plain are alike?
   - What are some of the environmental problems on the Atlantic Coastal Plain and the Pacific Coastal Plain?

EVALUATION:

1. Student activities and projects/reports.
2. Questions asked guest speakers.
3. Map work.

AREA OF STUDY: OUTDOOR EDUCATION (language arts, science, and social studies) GRADE RANGE: 5-6

CONCEPT: Concern for the natural environment should be coupled with its recreational use.

PURPOSE: To acquaint students with the beauty and character of different parts of the United States.

ACTIVITIES:

1. Students take field trips and daytrips into the local environment to determine characteristics of the area -- whether it is part of the Atlantic Coastal Plain, the Great Central Basin, or the Pacific Coastal Plain.

2. Students (as individuals or in committee) select a section of the nation and develop reports; complete with visuals and artifacts of that region.

3. Students identify environmental problems of a given area of the nation and research them. Reports can be developed and presented to the class.

4. Students and guest speakers who have visited/lived in different parts of the nation discuss their experiences and the characteristics of the region(s).

5. Students learn and use new vocabulary words related to the topic.

. aggradation	. degradation
. similarities	. geographic region

EVALUATION:

1. Student activities and reports/projects.

2. Questions asked guest speakers.

3. Use of vocabulary words.

4. Teacher-made quizzes and tests.

AREA OF STUDY: OUTDOOR EDUCATION (language arts, science, and social studies) GRADE RANGE: 5-6

CONCEPT: Concern for the natural environment should be coupled with its recreational use.

PURPOSE: To acquaint students with the beauty and character of different parts of the United States.

ACTIVITIES:

1. Students - equipped with daytrip gear and support materials (e.g., day packs, canteens, compasses, pup tents, first-aid kits) - go out into a natural area and set-up a campsite. They are instructed in the setting-up of a campsite - how to manage a campsite - and how to break a campsite down -- leaving the natural area as found.

2. While in the natural setting -- students are introduced to geology of the region, harmful plants, and first aid. Local resource people from outing clubs and rescue units can be used as instructors. Parents of students in the class can also be used as resource people.

3. Students take field trips to local recreational/tourist facilities and learn how the local environment can/is used for entertainment and enjoyment. Still pictures and motion pictures can be taken and students can develop follow-up reports.

EVALUATION:

1. Student activities and reports/projects.

2. Student skills related to camping out.

3. Student involvement in first aid training and practice sessions.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 5-6

CONCEPT: Characteristics of species

PURPOSE: To acquaint students with diverse animal and plant life by species.

ACTIVITIES:

1. Students are introduced to the topic: structural adaptations in animals. They research and discuss the topic. What structural changes have taken place in given animals over the years? Why?

2. Students research the question: In what ways does adaptation protect the individual living thing and the species? Reports can be developed.

3. Each student selects an animal and develops a report re: structural adaptation over the centuries. Visuals can be used in the report.

EVALUATION:

1. Student reports and projects.
2. Class discussions.
3. Teacher-made quizzes and tests.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 5-6

CONCEPT: Characteristics of species

PURPOSE: To acquaint students with diverse animal and plant life by species.

ACTIVITIES:

1. Students are introduced to the topic: color adaptations in plants and animals. Why do things adapt? In what ways does adaptation protect both the individual living thing and the species?

2. Each student selects an animal or plant and researches it re: color adaptation over the centuries. Visuals can be used in the report.

3. Guest speakers discuss color adaptation and the use of color as a protective device with both animals and plants.

4. Using films and filmstrips -- students can be shown color adaptation in both plants and animals.

5. Students develop a bulletin board depicting color adaptation in both animals and plants.

EVALUATION:

1. Student activities and reports/projects.
2. Discussions and questions asked guest speakers.
3. Teacher-made quizzes and tests.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 5-6

CONCEPT: Characteristics of species

PURPOSE: To acquaint students with diverse animal and plant life by species.

ACTIVITIES:

1. Students are introduced to the topic: Natural Reclaimation. They research and discuss the questions: In what ways can nature reclaim an area that has been destroyed by fire? What is succession? How can/does man retard nature's succession? How can/does man aid nature's succession?

2. Guest speakers discuss the reclaiming of a given area by nature. For example -- they can discuss and graphically show how a burned over area can be reclaimed by nature, and how farm land left unworked can revert back to a wooded setting.

3. Students take field trips to reclaimed areas and see how nature's process works.

4. Each student selects a topic related to natural reclaimation and develops a report for the class.

EVALUATION:

1. Student activities and projects/reports.

2. Questions asked of guest speakers.

3. Student involvement in field studies/activities.

4. Teacher-made quizzes and tests.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 5-6

CONCEPT: Characteristics of species

PURPOSE: To acquaint students with diverse animal and plant life by species.

ACTIVITIES:

1. Students are involved in a study of amphibians, insects, birds, mammals, and reptiles.
2. Each student selects an animal life form and develops a class report -- complete with visuals or live specimens.
3. Guest speakers discuss various forms of life: explaining lifestyles, habits, behaviors, etc.
4. Students are taken on nature walks and field trips to natural areas to observe and to study amphibians, insects, birds, mammals, and reptiles. They can collect specimens, take pictures, make drawings, and record sounds -- as well as keep logs of their observations.
5. Students make bulletin boards depicting the amphibians, insects, birds, mammals, and reptiles observed and studied.

EVALUATION:

1. Student activities and reports/projects.
2. Student field studies.
3. Student reports and questions asked of guest speakers.
4. Teacher-made quizzes and tests.

AREA OF STUDY: NATURAL ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 5-6

CONCEPT: Characteristics of species

PURPOSE: To acquaint students with diverse animal and plant life by species.

ACTIVITIES:

1. Students are introduced to new vocabulary words related to the topic of study.

. characteristics	. species	. diversity
. adaptation	. animals	. amphibians
. insects	. mammals	. reptiles
. birds	. structure	. function
. organisms	. reclaim	. succession

2. Students develop hypothetical food chains and visually demonstrate their function.

3. Guest speakers discuss local area food chains.

4. Students collect samples of local vegetation and study its development. Logs can be kept and reported upon by students.

EVALUATION:

1. Student activities and reports/projects.
2. Use of learned vocabulary words.
3. Questions asked guest speakers.
4. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (mathematics) GRADE RANGE: 5-6

CONCEPT: Height

PURPOSE: To use the shadow ratio method to measure the height of a tree or any tall object.

ACTIVITIES:

1. Place a meter stick perpendicular to the ground and measure the length of its shadow.
2. Measure the length of the selected tree's shadow.
3. Students solve this proportion: $\frac{\text{shadow of tree}}{\text{shadow of stick}} = \frac{\text{object's height}}{\text{stick's height}}$
4. Students can repeat this shadow ratio method with other objects.

EVALUATION:

1. Student activities.
2. Student calculations/answers

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (mathematics and science)

CONCEPT: **Celcius thermometer** GRADE RANGE: 5-6

PURPOSE: To acquaint students with the celcius thermometer and how to graph temperature variances over a period of time.

ACTIVITIES:

1. Students discuss good locations for thermometers (e.g., near buildings, near rivers, the center of town). They also discuss methods of placement.
2. Once students have determined locations which will provide them with large variances in temperature -- thermometers are placed in these locations.
3. Once-a-day students read each thermometer and record the temperature reading in a log. READINGS WILL BE KEPT FOR 30 DAYS AT EACH SITE.
4. Once all temperature readings have been collected and recorded -- students make graphs and chart the temperature readings for each location. Later, graphs are compared and discussed as to why there are variances between temperature readings in different locations.
5. Students research the topic: thermometers and develop reports.
6. Students make large scale models of thermometers and discuss how each is to be read.

EVALUATION:

1. Observations of student activities.
2. Student activities and projects.
3. Student reports.
4. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (mathematics) GRADE RANGE: 5-6

CONCEPT: Metric length

PURPOSE: To acquaint students with the metric system of measurement in relation to our environment.

ACTIVITIES:

1. Prior to going out into the natural and social environments of the community -- students are introduced to the concept: metric measurement and discuss it in relationship to the more-familiar measure of inches, feet, and yards.

2. Students research the topic: metric measurement and discuss their findings in class.

3. Equipped with metric measuring devices, clipboards, pens and pencils, etc. students go out into the community and conduct their research.

4. Specific items/objects are measured (in length, width, height) and the data is recorded on charts.

5. Back in school -- students discuss their experiences and findings.

EVALUATION:

1. Student activities and projects.

2. Student discussions.

3. Teacher-made quizzes and tests.

AREA OF STUDY: PLANTS AND ANIMALS (language arts and science) GRADE RANGE: 5-6

CONCEPT: Characteristics of species

PURPOSE: To acquaint students with various plants and animals.

ACTIVITIES:

1. Prior to a nature hike -- students use reference books to develop their recognition of plants and animals (including birds).
2. During the course of the reference source review -- students discuss their impressions and ask questions.
3. Students are taken into the natural environment of the community for a nature hike. DAYTRIP EQUIPMENT CAN BE TAKEN (e.g., day packs, canteens, ground cloths, compasses).
4. During the course of the hike -- students record their observations of various plants and animals. Field based discussions can be conducted.

EVALUATION:

1. Student activities.
2. Class and field based discussions.
3. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (mathematics) GRADE RANGE: 5-8

CONCEPT: Angles measurement(s)

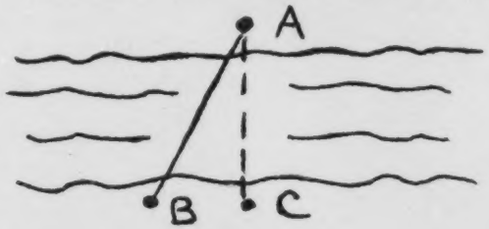
PURPOSE: To acquaint students with measuring a river or stream using angles.

ACTIVITIES: 1. In the field -- students select a clearly visible point (an object) across the river or stream (refer to this point as POINT A).

2. Students then mark their position with a stake (POINT B)

3. Students then walk along the edge of the river or stream until they reach a point that is directly across from point A -- thus making a 45 degree angle (compasses are to be used to measure the 45 degree angle). THIS POSITION IS REFERRED TO AS POINT C

4. Students should realize that in a 45 degree (isosceles) right triangle the two sides are of the same length. To determine the width of the river or stream -- measure the distance between points B and C.



EVALUATION: 1. Student activities in the field.

2. Student calculations and answers.

3. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (art and science) **GRADE RANGE:** 5-8

CONCEPT: Each species of tree, weed, grass, flower, etc. has its own growth pattern.

PURPOSE: To train the human eye to observe and to record individual growth patterns so as to be able to identify species from drawings.

ACTIVITIES:

1. Students are taken out into the natural environment of the community to conduct field studies.
2. Each student selects a plant, weed, flower, etc. to study. Students discuss the physical characteristics of their selected object.
3. Each student makes sketches of the object(s) they selected to study. EACH SKETCH OF THE SELECTED OBJECT WILL BE MADE FROM A DIFFERENT ANGLE.
4. From the several sketches -- each students makes a composite drawing of the selected object(s). IT IS IMPORTANT THAT EACH STUDENT RECORD THE PROPORTIONS, ANGLES, AND DETAILSOF THE OBJECT IN HIS/HER DRAWING(s).

EVALUATION:

1. Student activities.
2. Realism and detail of sketches and drawing.
3. Group discussions.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (art and social studies)

CONCEPT: Historical landmarks GRADE RANGE: 5-6

PURPOSE: To acquaint students with historical landmarks as objects of beauty -- possessing aesthetic value.

ACTIVITIES:

1. Students are taken out into the social and human environment(s) of the community -- for purposes of acquainting them with local historical landmarks. EACH STUDENT STUDIES THE LANDMARK(s) FOR PROPORTION, LINE, AND VALUES OF DARK AND LIGHT.

2. While on the community tour -- students discuss the historical significance of each landmark.

3. Each student sketches the landmark -- attempting to capture its characteristics and character.

4. After completing drawings -- students discuss their work.

EVALUATION:

1. Student activities and projects.

2. Student drawings.

3. Student discussions.

AREA OF STUDY: ENVIRONMENTAL EFFECTS (science and social studies) GRADE RANGE: 5-6

CONCEPT: Environment

PURPOSE: To acquaint students with the fact that the environment of a given area can either help or hinder the production of food by humans.

ACTIVITIES:

1. Students are shown ground level and aerial slides of the agriculture of the region.
2. Students discuss the factors/forces which help agricultural production in the region. Those factors/forces which hinder agricultural production in the region.
3. Students discuss the term: topography and discuss it in relation to the local region.
4. Students are taken on field trips to inspect local farms, orchards, etc.
5. Guest speakers discuss local agriculture: farming methods, soils, growing seasons, crop diseases, etc.

EVALUATION:

1. Student activities and projects.
2. Questions asked guest speakers.
3. Class discussions.
4. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL EFFECTS (language arts and social studies)

CONCEPT: Ways of human life **GRADE RANGE**: 5-8

PURPOSE: To acquaint students with the contrasting life styles of people living in different geographical areas.

ACTIVITIES:

1. Students select a remote region of the world -- and begin a study of life style comparisons: their local life styles and those of the people of the selected (remote) region.
2. Each student selects a life style factor and researches it. Class reports can be developed. STUDENTS MAY CHOOSE TO MAKE GRAPHIC MEDIA VISUALS (e.g., slides, still pictures, motion pictures).
3. Students investigate and compare the jobs of local people and of those in the selected area. THIS ACTIVITY AND OTHERS RE: COMPARING OF LIFE STYLES WILL FOLLOW THE PRESENTATION (background information) OF INFORMATION ABOUT THE SELECTED AREA (e.g,, films, filmstrips, slides, posters).
4. Guest speakers from the local community -- and those who are familiar with the selected comparison site discuss life styles.

EVALUATION:

1. Student activities and projects.
2. Questions asked of guest speakers.
3. Student reports.
4. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL EFFECTS (science and social studies) GRADE RANGE: 5-8

CONCEPT: Natural resources

PURPOSE: To enable students to understand that man's activities are determined by the environment; that industry in a given area is largely determined by the raw materials readily available.

ACTIVITIES:

1. Students discuss and research the topic: transportation of raw materials. What are some of the means of transporting raw materials from the source of supply to the processing site(s) ? What are the jobs involved in transporting materials from source to processing site(s) ?
2. Guest speakers discuss the process of transporting materials from source to sites -- and the equipment and jobs involved in this process.
3. Students take field trips to sites -- to observe the processing of raw materials. INFORMATION CAN BE GATHERED - VISUALS CAN BE TAKEN - REPORTS CAN BE DEVELOPED.
4. If possible - students are taken to the sources of raw materials -- to observe their ' harvesting ' and packing for shipment to processing sites.
5. Students can be shown films - filmstrips - slides which depict the harvesting-shipping-processing of raw materials.

EVALUATION:

1. Student activities and projects.
2. Student field studies.
3. Questions asked guest speakers.
4. Research reports.
5. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (science) GRADE RANGE: 5-8

CONCEPT: Relationships of living and non-living things.

PURPOSE: To acquaint students with the relationships between living and non-living aspects of the total life space environment.

ACTIVITIES:

1. Prior to going out into the life space environment -- students discuss living and non-living things. They give examples of both -- thus comparing the similarities and differences between each type (e.g., require food, take up space, serve a function, have feelings, reproduce, have a life cycle).

2. Students are taken out into the environment for either a nature walk or a fieldtrip. Students record all the living and non-living things that they see. PHOTOS-SLIDES-MOTION PICTURES-VISUAL DRAWINGS-VIDEO TAPES CAN BE MADE AND KEPT FOR LATER USE IN THE CLASSROOM.

3. Students make posters and bulletin boards which depict the living and non-living objects found/observed.

4. Students develop reports which compare living and non-living objects observed.

EVALUATION:

1. Student activities and projects.
2. Student reports.
3. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (science and social studies) GRADE RANGE: 5-8

CONCEPT: Pond life

PURPOSE: To acquaint students with the living things in and around a pond and to determine factors which effect life in a pond.

ACTIVITIES:

1. Students are taken on a nature walk to a pond area. While there - students will:

   . take a walk around the pond and study its properties. They will make a map of the pond and surrounding area -- indicating the pond's shape and size, plant growth, incoming water, outgoing water, animal life, etc.

2. Students will conduct research activities: take the temperature of the water and test for Ph and oxygen content. They will also use plankton nets to collect samples - will collect mud samples - will take samples of pond water, etc.

3. Students will search the area for signs of animal life -- and will attempt to determine the reasons why there is or isn't life in the area.

4. Guest speakers discuss local bodies of water and the factors which effect them. GUEST SPEAKERS CAN ALSO GO ALONG WITH STUDENTS TO THE POND AND LECTURE TO STUDENTS WHILE THEY CONDUCT THEIR FIELD STUDIES.

EVALUATION:

1. Student activities and projects.
2. Questions asked guest speakers.
3. Field research studies.
4. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL EFFECTS (social studies) **GRADE RANGE:** 7-8

CONCEPT: Climate and topography

PURPOSE: To acquaint students with the fact that the climate and topography of an area greatly effect life styles of humans.

ACTIVITIES:

1. Students define and discuss the words: climate and topography.
2. Students select a geographical region and compare its climate and topography with that of the local region. Students compare the similarities and differences of:
   - land
   - natural resources
   - religion
   - clothing
   - agriculture
   - people
   - schooling
   - animal life (wild and domestic)
3. Guest speakers discuss local climate and topography re: human life styles.

EVALUATION:

1. Student activities and projects.
2. Questions asked guest speakers.
3. Student reports.
4. Bulletin boards which depict the similarities and differences between life styles of the local area and the comparison site.
5. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL CAREERS (career education, science, and social studies)

CONCEPT: Health and safety GRADE RANGE: 7-8

PURPOSE: To acquaint students with environmental careers and the need for job safety and personal health.

ACTIVITIES:

1. What is OSHA ? Students investigate the Occupational Safety and Health Act. There are discussions of the provisions of OSHA and the need for such legislation.
2. Students investigate several environment related careers and discuss them. EACH STUDENT SELECTS ONE ENVIRONMENT RELATED CAREER - RESEARCHES THE CAREER TO DETERMINE THE EDUCATIONAL NEEDS AND JOB DUTIES OF THAT CAREER. REPORTS CAN BE DEVELOPED AND PRESENTED TO THE CLASS OR INCORPORATED INTO THE CLASS DISCUSSIONS AS DATA SOURCES.
3. Students role-play environment related careers and jobs.
4. Guest speakers discuss the environment related careers they are in -- as well as educational training needs of the job.

EVALUATION:

1. Students conduct a career week -- informing students of the environment related careers/jobs that one can train for -- and the training requirements.
2. Students make posters and bulletin boards depicting environment related careers and jobs.
3. Student activities and projects.
4. Student reports.
5. Questions asked guest speakers.
6. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (science and mathematics) **GRADE RANGE:** 6-8

CONCEPT: Streamflow

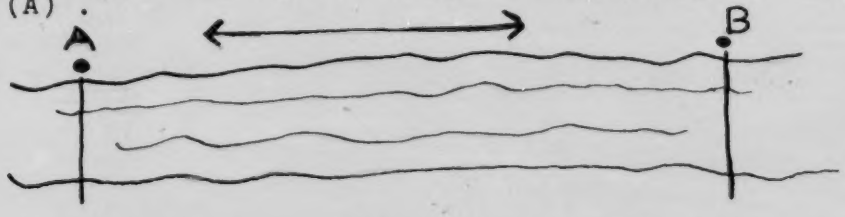
PURPOSE: To acquaint students with the process of measuring streamflow -- in order to determine the amount of water in a stream.

ACTIVITIES:

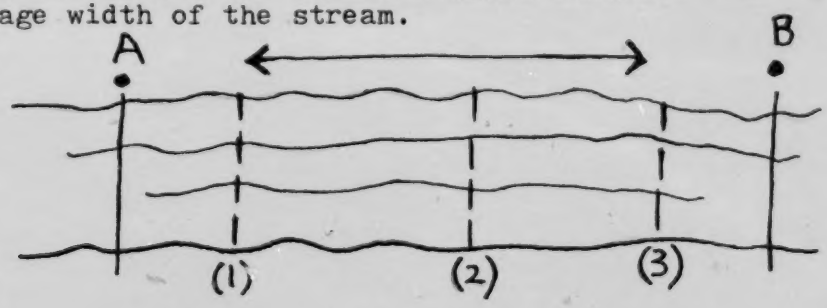
1. Students take a field trip to a natural area -- for purposes of determining streamflow.

2. Once at a stream -- students measure and mark a specified straight distance along the stream. Once the distance is measured (e.g., 25 feet, 50 feet, 100 feet) a 2-3 inch stake is driven into the ground at each end of the measured distance.

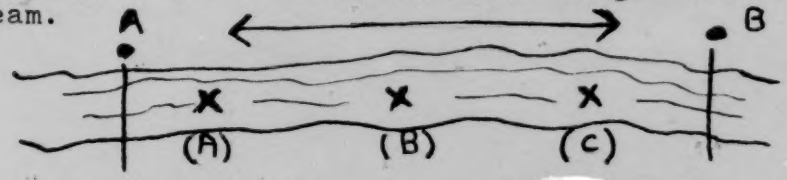
3. A small stick is thrown into the stream above the upstream stake (B). Students record the number of seconds that it takes for the stick to float downstream between the upstream marker (B) and the downstream marker (A) .



4. Students find the average width of the marked section of the stream by measuring the width of the stream at three places between stakes A and B. Divide the total of measurements 1 - 2 - 3 to get the average width of the stream.



5. In order to determine the average depth of the stream section between points A and B students measure the depth of the stream in at least three places (between A and B) in a straight line. Divide the total of the three measurements to get the average depth of the stream.



6. In order to find the cubic feet of water flow per second -- students multiply the average width, the average depth, and the number of feet the stick floated each second.

<u>average width</u> x <u>average depth</u> x <u>feet per second</u> = cubic feet of water flowing per second

<u>NOTE</u>: A cubic foot of water is the amount of water in a container 1 foot wide, 1 foot high, and 1 foot long and contains 7/48 gallons.

7. In order to find out how many people can live from the water in a selected stream -- students calculate:

streamflow in cubic feet per second	X	gallons in one cubic foot of water	=	gallons of water per second		
gallons per second	X	seconds in a minute	=	gallons of water per minute		
gallons of water per minute	X	number of minutes in a day	=	total gallons of water per day	+	
amount of water one person uses per day	=	total number of people who can live from the water in the selected stream.				

EVALUATION: 1. Student field studies.
2. Student calculations and methods used to derive answers.
3. Teacher-made quizzes and tests.
4. Student discussions.

AREA OF STUDY: COLONIAL SETTLEMENT (language arts and social studies) GRADE RANGE: 7-12

CONCEPT: Human population settlement

PURPOSE: To develop student understandings of how the early settlers of the region adapted to the environment -- for purposes of survival.

ACTIVITIES:

1. Students study local colonial history. Field trips can be taken to area historical landmarks.
2. Guest speakers discuss local history and colonial ways-of-life with students.
3. Students are shown motion pictures and slides/filmstrips which depict colonial life styles.
4. Students develop colonial life reports. How did settlers adapt ?
5. How did the early settlers treat/use the natural resources of the area ?
6. Students make bulletin boards which depict colonial life of the area.

EVALUATION:

1. Student activities and projects.
2. Questions asked guest speakers.
3. Students role-play colonial life of the area.
4. Student reports.
5. Teacher-made tests and quizzes.

AREA OF STUDY: LOCAL/REGIONAL INDUSTRY (language arts and social studies)

CONCEPT: The industrial revolution GRADE RANGE: 7-12

PURPOSE: To acquaint students with the industrial revolution in the local area.

ACTIVITIES:

1. What was the industrial revolution ? How did it effect the region ? Students research and discuss these questions.
2. What were some of the early types of industry of the region ? Where were early factories located in the region ? How were natural resources used ? Students research and discuss these questions.
3. Guest speakers discuss early industry of the region. VISUALS MAY BE SHOWN - IF AVAILABLE.
4. Students develop bulletin boards which depict early industry of the region.
5. Students take field trips to local factories and mills -- in order to better understand the manufacturing process. STUDENTS CAN COMPARE THE MODERN METHODS AND MACHINERY WITH THE METHODS AND MACHINERY OF EARLIER FACTORIES AND MILLS OF THE REGION.

EVALUATION:

1. Student activities and projects.
2. Questions asked guest speakers.
3. Student reports.
4. Bulletin board displays.
5. Teacher-made quizzes and tests.
6. Students role-play early industrial revolution jobs.

AREA OF STUDY: CONSERVATION (language arts, science, social studies) GRADE RANGE: 7-12

CONCEPT: Wildlife

PURPOSE: To acquaint students with the controversy over the 'sport' of hunting and fishing re: wildlife management.

ACTIVITIES:

1. Students discuss the topic: MAN IS A CARNIVOROUS ANIMAL. They research to identify world-wide patterns of animal domestication and wildlife as a food supply.

2. Guest speakers discuss the pros-and-cons of hunting and fishing re: wildlife management. Students ask questions re: hunting and fishing laws -- and their enforcement, wildlife management and resources conservation, recreation, effects upon the local economy, wildlife management related careers and jobs, etc.

3. Students develop reports re: the effects of hunting and fishing upon the local economy.

4. Students take field trips to local/regional fish hatcheries, wildlife sanctuaries, and recreational sites for purposes of learning how wildlife is managed and provides jobs for local people and money to the local economy.

5. Students make displays re: local wildlife and their habits. Reports can also be developed -- complete with visuals.

EVALUATION:

1. Students activities and projects.

2. Student reports.

3. Questions asked guest speakers.

4. Field studies.

AREA OF STUDY: CONSERVATION (language arts, science, social studies) GRADE RANGE: 7-12

CONCEPT: Energy sources are finite

PURPOSE: To acquaint students with the fact that the conservation of energy is paramount to MAN's continued existence on Earth.

ACTIVITIES:

1. What is energy ? What are MAN's basic energy sources ? What are alternative energy sources ? Students research and discuss these questions. REPORTS CAN BE DEVELOPED.

2. Guest speakers discuss the topic: energy and its source(s).

3. Students take field trips to local/regional power plants and sites of alternative energy (if available in the area). SLIDES, MOTION PICTURES, VIDEO TAPES CAN BE MADE - IF PERMISSION IS GRANTED AT THE SITE.

4. Students go out into the community to determine the various uses of energy in the community. They keep logs of their observations and may also take slides, motion pictures, or make video tapes of their observations.

5. In the home -- each student keeps a 30 day log of the various uses of energy. Upon completion of these studies -- students propose ways by which energy can be conserved in the home.

EVALUATION:

1. Student activities and reports.
2. Student field based studies.
3. Questions asked guest speakers.
4. Student displays.
5. Discussions.

AREA OF STUDY: NATURAL RESOURCES (language arts, science, social studies)

CONCEPT: Conservation GRADE RANGE: 7-12

PURPOSE: To help students realize that the natural resources of the local area (timber) must be wisely managed.

ACTIVITIES:

1. Students investigate the history of the local area to determine the effect(s) of raw materials (timber) on the growth and economy of local communities.

2. Guest speakers discuss the growth of local communities and the use of raw materials (timber)by local industries.

3. Students tour local mills and factories which use local raw materials. SLIDES, MOTION PICTURES, AND VIDEO TAPES MAY BE TAKEN - WITH THE PERMISSION OF THE SITES.

4. Students develop reports re: local use of raw materials.

5. Students are taken on field trips to observe woodlands management techniques: clear cutting and selective cutting. VISUALS MAY BE MADE.

EVALUATION:

1. Student activities and reports.
2. Questions asked guest speakers.
3. Field based studies and projects.
4. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (mathematics and science) GRADE RANGE: 7-12

CONCEPT: Land use

PURPOSE: To acquaint students with the factors that determine how a particular piece of land should be used.

ACTIVITIES:

1. Guest speakers discuss the factors which effect the use of a piece of land.

2. Students are taken out into the community -- to a parcel of land for purposes of studying its characteristics. At the site they look for:
   - slope of the land
   - Ph of the soil (soil tests must be run)
   - plant growth
   - rocks or ledge

3. With information in-hand students draw a map of the area and identify slope, soil composition, plant growth, and rocks/ledge outcroppings .

EVALUATION:

1. Student activities and projects.

2. Questions asked guest speakers.

3. Map work.

4. Teacher-made quizzes and tests.

AREA OF STUDY: SOIL CONSERVATION (science) GRADE RANGE: 7-12

CONCEPT: Soil

PURPOSE: To acquaint students with the composition of soil -- at selected sites.

ACTIVITIES:

1. Students are taken out into the community to study the composition of soil at selected area sites. At each site-- students:
   . select a 3 foot X 3 foot area.
2. The chosen area is marked off (with stakes) and students dig below the top soil.
3. As layer after layer of soil is removed -- students record their findings and make sketches of the layer profiles. They will note soil composition, color, and texture.
4. Students discuss their findings and enter their observations into a log.

EVALUATION:

1. Student field based activities.
2. Discussions .
3. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (consumer education and social studies)

CONCEPT: Leisure-time GRADE RANGE: 7-12

PURPOSE: To acquaint students with outdoor leisure-time activities and equipment.

ACTIVITIES:

1. Guest speakers discuss the local recreational industry and ways by which individuals can spend/enjoy their leisure-time.
2. Students take field trips to local/regional recreation sites and are introduced to the tourist industry. Students are also made aware of the effects of the recreation industry on the local economy and jobs.
3. Representatives of outing clubs and local sports organizations meet with the students and discuss their leisure-time activities. EQUIPMENT MAY BE SHOWN AND DEMONSTRATED.
4. Each students selects a leisure-time activity and develops a report--including the equipment used in the activity. THESE REPORTS MAY BE COMPLETE WITH VISUALS.
5. Students may be taken on a one day or overnight camping trip.

EVALUATION:

1. Student activities.
2. Discussions.
3. Reports.
4. Group activities and personal involvement/participation/cooperation.
5. Questions asked guest speakers.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (business education and social studies)

CONCEPT: Land GRADE RANGE: 7-12

PURPOSE: To acquaint students with what land is and how it is/can be used to serve man.

ACTIVITIES:

1. Students are given a problem to discuss and to solve.

   OIL is discovered under the land on which your home is built. Can you sell the oil and the land below the surface -- yet retain title to your home and the surface land ?

2. A lawyer meets with the students and discusses the legal definition of land: the air space above and whatever is beneath the surface to the very center of our planet plus everything of a permanent nature that is attached to the soil.

3. Students role-play the situation described in # 1 -- and resolve the question.

EVALUATION:

1. Student role-playing.
2. Questions asked the guest speaker(s).
3. Discussions.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (art and science) GRADE RANGE: 7-12

CONCEPT: Designs in nature

PURPOSE: To acquaint students with the use of natural objects as the basis for abstract original designs.

ACTIVITIES:

1. Students are taken out into the natural environment of the community to collect objects for study.
2. At the selected site(s), students collect:
   - dandilions
   - rocks
   - bark
   - mushrooms
   - grass
3. Students draw sketches of the objects selected for study.
4. Students exagerate the objects to create new original designs.

EVALUATION:

1. Student activities.
2. Student sketches and original designs.
3. Discussions.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (language arts) GRADE RANGE: 7-12

CONCEPT: Creativity in writing

PURPOSE: To enable students to create original pieces of writing related to the natural and social environments of the community.

ACTIVITIES:
1. Students are taken out into the community to observe their surroundings.
2. Based upon community observations students are asked to write realistic descriptions of what they saw.
3. Students are asked to write about the similarities and differences between natural and social environments observed.

EVALUATION:
1. Student writings.
2. Student discussions.
3. Field work activities.

AREA OF STUDY: NATURAL ENVIRONMENTS (art and science) GRADE RANGE: 7-12

CONCEPT: Textures

PURPOSE: To acquaint students with textures in the natural environment(s) as a basis for a creative design.

ACTIVITIES:

1. Students are taken out into the natural environment of the community to select objects for study.

2. Each student -- once at the natural site -- selects an object or objects for study. These objects may include bark, leaves, weeds, flowers, stones, etc.

3. The students discuss the texture and characteristics of the objects collected.

4. Each student studies his/her object and incorporates it into an original piece of art work.

EVALUATION:

1. Student activities.
2. Discussions.
3. Pieces of original art work.

AREA OF STUDY: CONSERVATION (language arts, science, and social studies)

CONCEPT: Natural resources are finite GRADE RANGE: 9-12

PURPOSE: To acquaint students with the need to conserve natural resources -- in order to guarantee supplies for future generations on Earth.

ACTIVITIES:

1. Students are introduced to/define terms related to the topic of study.
   - natural materials
   - synthetic materials
   - recycling
   - finite
2. What are some of the similarities and differences between natural and synthetic materials ? Students research and discuss this question. REPORTS CAN BE DEVELOPED.
3. How are natural resources of the area used locally ? Guest speakers discuss this question with students.
4. Students take field trips to local businesses and industries which use natural resources. VISUALS CAN BE TAKEN AND REPORTS DEVELOPED.
5. Students visit local recycling plants and processes -- if available.

EVALUATION:

1. Student activities and projects.
2. Reports.
3. Questions asked guest speakers.
4. Graphic data produced.
5. Teacher-made quizzes and tests.

AREA OF STUDY: CONSERVATION (language arts, science, and social studies)

CONCEPT: Reforestation GRADE RANGE: 9-12

PURPOSE: To acquaint students with the policy and practice of reforestation -- in the local natural environment(s).

ACTIVITIES:

1. What is reforestation ? How is it practiced locally ? Guest speakers discuss these questions with students.
2. Students are taken to local natural sites where reforestation is going on. They can also be taken to local tree farms.
3. Students develop class reports on their observations and the topic: reforestation.
4. Why is a policy of reforestation important to the local economy and to the natural resources of the area ? Students research and discuss this question.
5. Students develop displays and bulletin boards which depict the local use of natural resources (timber) and the process of reforestation.

EVALUATION:

1. Student activities and projects.
2. Questions asked guest speakers.
3. Reports.
4. Discussions.
5. Teacher-made quizzes and tests.

AREA OF STUDY: BIOTIC COMMUNITIES (science) GRADE RANGE: 9-12

CONCEPT: Life

PURPOSE: To acquaint students with the interrelationships between species of living things -- in a natural biotic community.

ACTIVITIES:

1. Prior to going out into the natural environment of the community students are introduced to the topic of study: biotic communities. What is a biotic community ? What are some of the components of a biotic community ?

2. The class is divided up into several smaller work groups. Each work group organizes itself and develops an activity time table as well as an activity duty list for each group member. IT IS IMPORTANT THAT EACH GROUP MEMBER HAS SPECIFIC DUTIES TO PERFORM AND TASKS TO ACCOMPLISH.

3. In the field -- each work group selects an area to study. Each group works in a specified QUADRANT. Each quadrant is sectioned off and all group members are involved in the study.

4. Each team investigates the selected quadrant -- finding as many forms of life as they can in that area. LIFE FORM SAMPLES CAN BE COLLECTED AND STUDIED IN THE FIELD OR IN THE CLASSROOM -- AT A LATER TIME.

EVALUATION:

1. Student activities in the field and in the classroom.
2. Student participation/cooperation in work groups.
3. Field studies and findings.
4. Teacher-made quizzes and tests.

AREA OF STUDY: BIOTIC COMMUNITIES (science) GRADE RANGE: 9-12

CONCEPT: Life

PURPOSE: To acquaint students with the interrelationships between species of living things -- in a natural biotic community.

ACTIVITIES:

1. Students are taken on a field trip to a natural area of the community environment -- to study a selected biotic community: forest community plant life.

2. Divided up into small work groups -- students study the forest area for different types of plant life. Three (3) groups of forest plant life are sought:
   - trees (woody plants with a single stem (a trunk))
   - shrubs (woody plants with branches near to ground-no trunk)
   - herbs (non-woody plants that die back (at least to ground level) in the winter)

3. Students collect samples of each group of forest plant life. Field based discussions can be conducted.

4. Plant specimens are taken back to the classroom for further study and discussion.

5. Students develop research reports and papers re: types and characteristics of plant life.

6. Guest speakers discuss plant life and biotic communities.

EVALUATION:

1. Student activities and reports.
2. Questions asked guest speakers.
3. Field work and discussions.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (language arts, science, and social studies)

CONCEPT: Pollution effects GRADE RANGE: 10-12

PURPOSE: To acquaint students with the effects of disposing of solid waste materials in the ground.

ACTIVITIES:

1. Students discuss solid waste disposal techniques and the contamination of water supplies (e.g., burning dumps, dumping into streams).
2. Guest speakers discuss local methods of solid waste disposal.
3. Students go out into the community to observe and study local solid waste disposal techniques. IF A SEWAGE TREATMENT PLANT IS AVAILABLE -- STUDENTS COULD TOUR THAT AS WELL AS OPEN DUMPS, LANDFILLS, etc.
4. Students develop reports re: techniques of solid waste disposal. What is being done locally at the time ? What alternative methods of waste disposal are available for use ? How does each method of disposal effect local water supplies ?
5. Based upon class studies -- students develop proposals for solid waste treatment and/or disposal and present these reports to town fathers -- for their consideration.

EVALUATION:

1. Student activities.
2. Questions asked guest speakers.
3. Reports.
4. Class proposals to town officials.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (language arts, science, and social studies)

CONCEPT: Pollution effects GRADE RANGE: 10-12

PURPOSE: To acquaint students with the fact that pollution ca be of an economic nature.

ACTIVITIES:

1. Students discuss the topic: land pollution. What is it ? Why does it exist ? What is the situation locally re: land pollution ?

2. Guest speakers discuss the local situation re: land pollution. What has been done in the past few years to prevent land pollution ? What kinds of land pollution exist locally -- at the present time ? How can these pollution problems be solved ? What is being done to solve them ?

3. Students go out into the community to observe and document local examples of land pollution. STUDENTS CAN TAKE SLIDES, MOTION PICTURES, OR MAKE VIDEO TAPES OF THEIR STUDY.

4. Students develop land pollution reports. THEY RECOMMEND CHANGES IN EXISTING POLICIES AND PROPOSE WAYS TO ELIMINATE LAND POLLUTION.

5. The students organize and conduct a land pollution clean-up campaign. They produce video tapes for broadcast on local television stations, they write articles for local newspapers, they develop visual displays for local store windows, they conduct a week-end rally for town's people.

EVALUATION:

1. Student activities.
2. Reports.
3. Field based studies.
4. Questions asked guest speakers.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (language arts, science, and social studies)

CONCEPT: Pollution effects GRADE RANGE: 10-12

PURPOSE: To acquaint students with some sources of air pollution.

ACTIVITIES: 1. Students discuss and research the topic: air pollution. What are some of the local sources/causes of air pollution ? What is being done to solve these problems ?

2. Guest speakers discuss the question of air pollution in the local community and beyond. What are some of the causes ? What are some of the solutions ?

3. Students are shown films, filmstrips, video tapes, and/or slides which visually depict the causes of air pollution -- and some of the things that can be done to prevent further air pollution. What are the effects of air pollution on humans ? STUDENTS RESEARCH AND DISCUSS THIS QUESTION.

4. Students go out into the community to observe and document some local pollution problems: causes and effects. FILMS AND VIDEO TAPES CAN BE MADE. INTERVIEWS CAN BE CONDUCTED.

EVALUATION: 1. Student activities.

2. Reports.

3. Questions asked guest speakers.

4. Discussions.

AREA OF STUDY: LAND USE (mathematics and science) GRADE RANGE: 10-12

CONCEPT: Cultivation of the land

PURPOSE: To acquaint students with one way by which land can be cultivated.

ACTIVITIES: 1. Students are presented with a hypothetical situation to solve.

A farmer bought a large tract of land. The first year he cultivated one unit square of land. Each year thereafter he decided to cultivate an additional amount of land such that the total land cultivated each year was a square tract an additional unit longer. If his unit has quadolic measure -- we may use the congruence property which states that congruent regions have equal measure and the additional property which states that area property is a non-negative real valued function design on geometric figures that is additive for non-overlapping regions to show the following are true.

- For the n^{th} year, the total land cultivated has a measure equal to that of a piece of land 'n' units square;
- Each year the total land cultivated has as its measure a quadolic number;
- The number of additional unit squares of land cultivated in any given 'n' can be written as the difference of two squares;
- In factoring this difference of two squares - one of the factors is always 1 and the second is of the form $2n + 1$;
- The additional units of land cultivated in any given year is two more than that of the proceeding year; and
- The number n^2 can be written as the sum of an arithmetic progression.

EVALUATION: 1. Student problem solving

2. Discussions.

AREA OF STUDY: CONSERVATION (Language Arts and Science) GRADE RANGE: 10-12

CONCEPT: MAN: An Endangered Species

PURPOSE: To acquaint students with the fact that mineral resources are finite.

ACTIVITIES:
1. Discussion of the need to challenge man's ingenuity to develop means to reclaim or recover minerals from wastes.
2. Guest speakers to discuss the topic: mineral reclamation.
3. Discussion of ways to conserve minerals and energy.
4. Guest speakers to discuss the topic: conservation of minerals and energy.
5. Students develop written reports re: finite minerals and energy conservation/sources.

EVALUATION:
1. Student discussions.
2. Teacher-made tests.
3. Student written/oral reports - complete with visuals.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (Art, Mathematics and Science)

GRADE RANGE: 10-12

CONCEPT: Environmental models

PURPOSE: To develop student knowledge of and appreciation for environmental models.

ACTIVITIES: 1. Students are introduced to the Infinite Snowflake hypothetical: snowflakes hit the ground in various shapes. One is viewed in the shape of an equilateral triangle. Each second, a new equilateral triangle emerges in the middle third of each side - continuous forever!

2. Students are to discover what they can about the infinite snowflake model.

EVALUATION: 1. The student should discover that:

.no limiting perimeter can be found.

.limiting area = $\frac{2}{5} n^2 \sqrt{3}$ square units if n = length of the original side.

AREA OF STUDY: ENVIRONMENTAL SENSORY AWARENESS (Art, Mathematics and Science)

GRADE RANGE: 10-12

CONCEPT: Models in nature.

PURPOSE: To develop student knowledge of models in the environment via sensory observation.

ACTIVITIES: 1. Students are introduced to a hypothetical mathematical problem - related to the natural environment.

The Infinite Tree:

1st day 2nd day 3rd day

This Infinite Tree grows one foot the first day. On second day, two new branches appear - each ½ foot in length and at right angles to each other. The third day, two new branches appear at each terminal point - again at right angles - but this time only ¼ foot in length. This process continues forever.

2. Students are to analyze the hypothetical and to discover whatever they can.

EVALUATION: 1. Students should be able to: discover that the limiting height is $\frac{4+\sqrt{2}}{3}$ and brendth of $\frac{2(\sqrt{2}+1)}{3}$ feet, by using right angle relationships and geometric series.

AREA OF STUDY: WESTWARD EXPANSION - GROWTH OF AMERICA (art, language arts, science, and social studies)

CONCEPT: Regional development of America GRADE RANGE: 10-12

PURPOSE: To acquaint students with an understanding of how natural resources have effected regional development in America -- as part of the westward expansion movement.

ACTIVITIES: 1. Students are involved in a study of: pioneer farming.

- where were the richest lands in the colonies?
- what was the first thing a farmer had to do on new land?
- what was the first major crop of the frontier?
- what law opened up the western lands for settlement?
- what method of farming was used on the plains where there was little rainfall?
- what types of shelter were built in areas where there was insufficient wood for log cabins?

2. Guest speakers discuss the topic with students. THEY MIGHT COMPARE MODERN FARMING TECHNIQUES WITH THOSE OF THE FRONTIERSMEN/EARLY SETTLERS. How are the techniques alike? How are the techniques different?

3. Students develop reports related to the topic: pione[illegible]arming.

EVALUATION: 1. Student activities.

2. Questions asked guest speakers.

3. Reports.

4. Discussions.

AREA OF STUDY: WESTWARD EXPANSION - GROWTH OF AMERICA (art, language arts, science, and social studies)

CONCEPT: Regional development GRADE RANGE: 10-12

PURPOSE: To acquaint students with an understanding of how natural resources have effected regional development in America -- as part of the westward expansion movement.

ACTIVITIES:

1. Students are introduced to the topic of study: pioneer craftsmen.
   - who was the first craftsman on the frontier?
   - who made hardware, kitchen utensils, wagon wheel rims?
   - what is the raw material used in pottery making?
2. Guest speakers discuss early pioneer craftsmen with students and discuss some of the early craft arts/skills that are still being used today.
3. Students are shown films, filmstrips, slides, etc. which show pioneer crafts. STUDENTS DEVELOP REPORTS RELATED TO THE TOPIC OF DISCUSSION.
4. Students go on field trips to nearby blacksmith shops, leather craft shops, pottery shops, etc. -- wherever there are examples of early pioneer crafts being demonstrated.
5. Students go to a nearby museum to observe examples of pioneer arts and crafts.

EVALUATION:

1. Student activities.
2. Reports and discussions.
3. Questions asked guest speakers.

AREA OF STUDY: WESTWARD EXPANSION - GROWTH OF AMERICA (art, language arts, science, and social studies)

CONCEPT: Regional development GRADE RANGE: 10-12

PURPOSE: To acquaint students with an understanding of how natural resources have effected regional development in America - as part of the westward expansion movement.

ACTIVITIES:

1. Students are introduced to the topic: life of the settlers. Why did people move west ? What was Frederick Jackson Turner's 'safety valve' thesis ? Who were the Council of Elders ? What kind of wagons were most often used ? Where were they made ?

2. Guest speakers discuss the ordeal of early settlers as they moved westward. They also discuss the way-of-life of the early settlers as they moved west.

3. Students are shown films, filmstrips, slides, video tapes, etc. re: the westward movement and how the settlers adapted to the environment.

4. Students develop class reports re: life of the early settlers.

5. Students are taken on field trips to nearby museums where they can see covered wagons, reproductions of colonial and westward expansion homes and cabins, etc.

EVALUATION:

1. Students role-play early settler's life styles.

2. Reports and discussions.

3. Written stories about moving west -- as children of the time would have written them.

4. Teacher-made quizzes and tests.

AREA OF STUDY: SOCIAL ENVIRONMENTS (Art, Career Education, Language Arts, Science and Social Studies)

GRADE RANGE: 7-9

CONCEPT: Man-made environments.

PURPOSE: To acquaint students with the character and composition of a local community.

ACTIVITIES:

1. Students identify communities of differing physical size and population in the local region. They learn that population density has a great effect on the lifestyle of the individual human and the collective society within the confines of a given geographical region.

2. What are the similarities/differences between cities, surburban areas, towns and villages in the local region? Students investigate and identify common characteristics of all human communities (essentials) and those "creature comfort" frills which are deemed essential - as a result of a highly sophisticated/technological lifestyle.

3. Using maps (e.g., topographic population, and soil profile) students investigate the topics: land use and land use planning in a given area.

   a. What are the natural features of the area? What are the man-made features of the area? How are the natural/man-made features compatible? How are they incompatible?

   b. Identify several man-made uses of the land. Identify the several land use zones (e.g., businesses/stores, homes, recreation/parks, and transportation routes).

4. Students take field trips into the natural and social environments - in order to better understand the character of each and the interdependence of both (e.g., museums, stores, hospitabls, manufacturing facilities, parks, woods, sewage treatment plants). NOTE: Slides, films and video tapes can be made/taken for later use.

5. Students research the topics: Man's Adaptation to the Life Space Environment(s) and Man's Manipulation of the Life Space Environment(s). Individual/group research reports are developed - complete with visuals.

6. Students are shown aerial shots of the local region (e.g., slides, motion pictures, video tapes) in order for them to perceive the character of the region from another perspective.

7. Guest speakers discuss human communities, natural communities, land use, population distribution, etc.

EVALUATION:

1. Students create table top models of the local community/region - depicting the natural and social characteristics of the area.

2. Student reports.

3. Field based activities and studies.

4. Discussions of topics such as land use and lifestyles - to provide a basis for determining student understandings.

5. The communicative content and quality of produced visuals.

AREA OF STUDY: NATURAL RESOURCES (Art, Language Arts, Career Education, Science and Social Studies)

GRADE RANGE: 9-12

CONCEPT: Conservation

PURPOSE: To acquaint students with the fact that most natural resources are finite and the need to manage the use of precious, limited commodities of available resources.

ACTIVITIES:

1. What is conservation? Students become involved in defining the term and providing examples of conservation efforts regarding natural resources (e.g., the air, water, trees, minerals, and soil).

2. Guest speakers visit classrooms to discuss the topic: conservation and their role (career/job tasks) in this management process.

3. Students take field trips to see some local conservation programs. NOTE: Graphic data can be collected and used at a later date (e.g., slides, films and or video tapes).

4. Some natural resources are finite while others are renewable. Students define each term and give examples of each:

   (a). finite: having definite or definable limites (e.g., the air, the soil, minerals); non-renewable commodities.

   (b). renewable: to make or become new, fresh, or strong again (e.g., crops, trees, animal species, plants); to restore to existence.

5. Students investigate supply, demand, and the balance of supply/demand in relationship to natural resources. They look at the processes of reforestation, reclamation, and recycling. How are the processes alike? How are they different? Students provide examples of each process.

6. Students go on excursions into the local community/region to identify and document examples of reforestation, reclamation, and recycling. Reports are developed.

7. How are natural resources used in the local community/region? What effect(s) do natural resources have upon the local economy, human life styles, and careers/occupations? Students investigate these questions (e.g., field trips, interviews, graphic studies using cameras and cassettes, nature walks, guest speakers).

8. What are synthetics? Students investigate the world of synthetics in order to determine their nature and relationship(s) to natural resources.

EVALUATION:

1. Students incorporate vocabulary words into their activities and experiences.

2. Table top scenes of area natural resources; utilization and conservation.

3. Students make maps of the area which depict natural features, natural resources, human population densities, natural habitats, human communities, etc.

AREA OF STUDY: FORESTRY (art, language arts, industrial arts, science, and social studies)

CONCEPT: The life cycle and characteristics of trees. GRADE RANGE: 10-12

PURPOSE: To acquaint students with the leaf characteristics of different trees.

ACTIVITIES:

1. Students research the topic: trees -- their life cycle and characteristics. REPORTS CAN BE DEVELOPED, DIAGRAMS OF TREE PARTS CAN BE MADE, VISUALS SUCH AS SLIDES CAN BE MADE, etc.
2. Guest speakers discuss the topic: trees -- their life cycle and characterisitcs. VISUALS MAY BE USED.
3. Students visit nearby tree farms and learn about the growth and care of trees.
4. Students go out into the field and collect coniferous (evergreen) leaves by leaf clusters or with small portions of twigs attached.
5. Students make collections of leaves and mount them for display.
6. Students sketch different types of leaves. These sketches are collected and displayed on a bulletin board.

EVALUATION:

1. Student activities and reports.
2. Field based activities and performance.
3. Sketches of leaves.
4. Discussions.
5. Teacher-made quizzes and tests.

AREA OF STUDY: ENVIRONMENTAL AWARENESS AND MANAGEMENT (Art, Language Arts, Mathematics, Science, and Social Studies)

GRADE RANGE: 10-12

CONCEPT: Land Use Planning

PURPOSE: To acquaint students with the nature of land use planning; its definition and purpose, the need to conserve local resources, the character and nature of the land, and to the beneficial and detrimental effects of various land uses.

ACTIVITIES:

1. Students are introduced to the topic: Land Use Planning. They learn that land use decisions are based on the: physical make-up of the land, available local (natural and human) resources, community needs, and community goals.

   a. Physical make-up of the land: slope, ph factor, soil structure and composition, soil depth, drainage, and chemical characteristics (e.g., nitrates, phosphates, and potassium).

   b. Community needs assessment: to determine the goals of the local area re: land use and future planning (e.g., better housing, open spaces, playgrounds/parks, sewage treatment facilities, rubbish disposal (e.g., open dumps, land fills, or incinerator(s)).

2. Guest speakers discuss land use planning policies at the local, regional and state level. Examples of local/regional land use planning are discussed with students.

3. Field trips into the local community to determine the physical characteristics of the land (e.g., slope, erosion, vegetation) as well as the chemical/physical properties (e.g., ph factor, texture, content).

   a. Chemical testing of the soil.

   b. Soil profiles.

   c. Test the soil for erosion potential.

   d. Vegetation growth/content in the soil.

4. Students look at the local community and determine human needs. They develop a list of priority needs:

   a. Places to live.

   b. Places to work.

   c. Food supplies.

   d. Recreation sites.

5. Field trips into the community to determine types and amounts of available resources (e.g., minerals, timber, clean water).

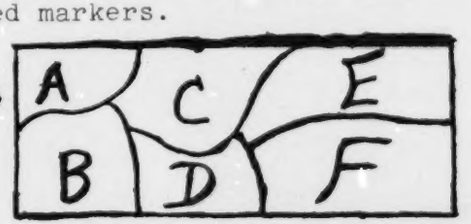
6. Guest speakers into classrooms to discuss the importance of open spaces and recreational areas to a given community and its inhabitants.

7. Students are introduced to and investigate both the beneficial and detrimental effects of each of the ten (10) land use areas on people and the life space environment.

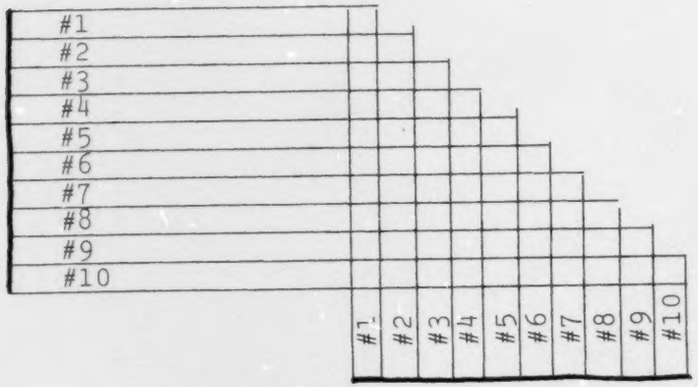
   .Commercial (#1)
   .Educational/institutional (#2)
   .Forest/Field (#3)
   .Gravel pits (#4)
   .Highways/railroads (#5)
   .Industrial (#6)
   .Open Space (#7)
   .Power Lines (#8)
   .Recreational (#9)
   .Residential (#10)

8. Using aerial photos/slides of a given area, students draw the outline of the local geographical area on sheets of newsprint and then mark off each different land use area (A-F) within the boundries of the local geographical area using different colored markers.

   Geographical area boundries →



9. Using a land use compatibility chart, students rate the compatibility of side-by-side land uses. NOTE: Reference is made to the ten land use areas identified in activity #7 (from commercial (#1) to residential (#10)).



LEGEND

a = a good combination
b = neither a good nor a bad combination
c = a bad combination

10. Students use local topographic, population, flood hazard, and sewer line maps overlays as a basis for determining the compatibility of existing land uses with existing natural conditions.

11. Based upon their studies, students propose a land use policy for the local area and present their findings to local community officials.

EVALUATION: 1. Student activities and projects.

2. Field based studies.

3. Correct usage of vocabulary words.

4. Map work and related skills.

AREA OF STUDY: FORESTRY (art, language arts, and science) GRADE RANGE: 10-12

CONCEPT: The life cycle and characteristics of trees.

PURPOSE: To acquaint students with the structure of native forest trees.

ACTIVITIES:

1. In the classroom -- students read about forest trees and make a display of different types of trees.

2. Guest speakers discuss forest trees native to the area. VISUALS CAN BE USED.

3. Students travel to nearby tree farms to learn about the life cycle and care of forest trees. STUDENTS CAN TAKE PICTURES.

4. Students are taken out into the woods to identify different types of native forest trees. While in the field -- students collect specimens re: the structure of native forest trees.

   . Each student (or small work groups) selects a specimen from a native tree. Each specimen should be about 1 inch or 1½ inches in diameter and 1 foot long. Each specimen should be tagged for location, type of tree, time of year, etc.

5. In the classroom -- the tree specimens are dried for a month before cutting. NOTE: THE SPECIMENS SHOULD NOT BE DRIED NEAR A STOVE. THE HEAT WILL CRACK THEM. When the specimens are thoroughly dried they are ready to cut and to prepare for mounting.

   . Find the straightest and smoothest section that is 3½ inches long and cut square across at one end of this section. Sandpaper the end surface of the piece of wood to be used.

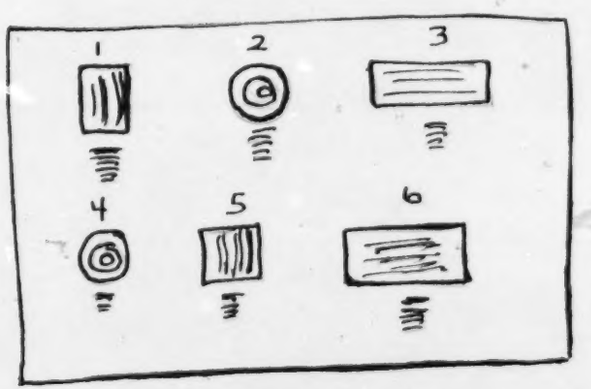
   . Again, cut across the piece of wood (square) ½ inch down on the sanded end. This makes a ½ inch disc.

- Turn the 3 inch sample piece upright in a vise and cut down in the middle for a distance of 3 inches. This will split the sample.

- Sandpaper smooth the cut surface of the best sample half.
- Cover the sample half with a thin coat of shellac.

6. Once prepared -- the tree samples are ready for mounting. Each student is involved in some aspect of this process.

   - Select a $\frac{1}{4}$ inch veneer or 3/4 inch pine board.
   - Fasten a 1 inch moulding to the edge of the wood piece to keep the board from warping and to add a finished appearance to the board.
   - Sandpaper or plane the surface of the board smooth and shellac or stain <u>before</u> mounting the specimens.
   - Mark lightly the location of each specimen on the board -- allowing a 1 inch space between different specimens.
   - Fasten the specimens to the board with flat-headed screws (put through the board from the back side and extending $\frac{1}{4}$ inch into each specimen) making sure the split specimen side is facing out.
   - Label each specimen.



EVALUATION: 1. Student projects.

2. Field based activities.

3. Discussions.

4. Questions asked guest speakers.

5. Teacher-made quizzes and tests.

6. Reports.

AREA OF STUDY: FORESTRY - TREES (Art, Language Arts and Science) GRADE RANGE: 9-12

CONCEPT: Trees: The life cycle and characteristics.

PURPOSE: To acquaint students with the history of local, the logging industry.

ACTIVITIES:

1. Retired lumberjacks and loggers either visit classrooms and discuss their 'adventures' or students go into the field to interview them.
2. Students research the topic: logging - as it relates to the local area.
3. How did the development of a logging industry in the local area effect the growth and development of communities? Other industries/businesses? The local economy?
4. What was the life of a lumberjack/logger life?
5. Students investigate to find the facts. Then compile their data into short stories or reports - to visualize for others the life and times of loggers.
6. How were early local lumber towns like the towns in the early West? How were they different?

EVALUATION:

1. Students projects/reports.
2. Teacher-made quizzes and tests.
3. Discussions.

AREA OF STUDY: FORESTRY - TREES (Art, Language Arts, and Science)

GRADE RANGE: 9-12

CONCEPT: Trees: The life cycle and characteristics.

PURPOSE: To acquaint students with the characteristics/structure of different twig types of native trees.

ACTIVITIES: In order to better understand the characteristics/structure of different tree twigs students will:

1. Take a nature walk into a forest area and will collect twigs that are 1½ inches or more long and that have both terminal and side leaf buds. The twigs of 15 or more native forest and shade trees should be collected. NOTE: Coniferous (evergreen) twigs should be collected with the needles attached.

2. When twigs are gathered a slip of paper bearing the name of the tree - location - season, etc. should be attached. This will avoid getting the identities of twigs mixed up at a later date.

3. Back in the classroom the twig samples may be mounted in either a looseleaf notebook or on a thin piece of veneer or wallboard for display purposes.

MOUNTING - notebook

1. Mount only one twig on a page.

2. Use adhesive tape or adhesive paper to fasten twigs to pages.

3. Print the family name in the upper left hand corner of each page.

4. The latin name of each twig should be printed in parenthesis underneath.

5. Write twig identification and uses data on the page. NOTE: Group twigs in the notebook by families.

MOUNTING - board

1. Select a piece of veneer or wall board (10" x 15" or 15" x 20").
2. Cover the front surface of the board with a thin coat of white shellac.
3. Locate each twig on the board and punch two small holes near the top and bottom of the location of each twig for fine copper wire to pass through.
4. Fasten twigs to board with fine copper wire.
5. Number each twig and identify in order mounted.

MAPLE FAMILY
Sugar Maple
(Acer Saccharam)

_____

_____

Uses: _____

_____

EVALUATION: 1. Student field work and data collection.

2. Display projects.

3. Discussions.

AREA OF STUDY: SEASHORE ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 9-12

CONCEPT: Oceans

PURPOSE: To acquaint students with the major influence of oceans in human survival; the control of global weather patterns, production of oxygen supply, source of food, and current effect on climates.

ACTIVITIES: 1. Oceans are a major part of the biosphere. Students are introduced to a formal study of the oceans of the Earth.

- students view films, filmstrips, and slides depicting the nature, composition, and function of oceans.
- students use world maps and globes to locate the oceans and to compare their size(s) and location with the Earth's land masses.
- guest speakers discuss the oceans -- their nature, their effect(s), and their importance to man.

2. Students develop reports re: the oceans of the world. THESE REPORTS CAN BE MADE COMPLETE WITH VISUALS.

3. Students take a field trip to a seashore environment and conduct field studies. STUDENTS CAN TAKE SLIDES, MOTION PICTURES, OR VIDEO TAPES OF THEIR STUDIES AND THE SEASHORE ENVIRONMENT -- FOR LATER USE BY THE CLASS OR OTHER CLASSES WHO MIGHT NOT BE ABLE TO TAKE A FIELD TRIP TO THE SEASHORE .

- students study the historical and geological perspectives of seashore formations.
- what were the glacial effects upon the shaping of the seashore(s) ?
- what are the effects of erosion on the seashore ? NOTE: EROSION OF GRANITE TO PRODUCE SAND - SAND WASHED OUT TO THE CONTINENTAL SHELF. BEACH FORMATION RESULTS FROM SAND CARRIED BY WAVES AND CURRENTS.

EVALUATION: 1. Student field study activities.
2. Questions asked guest speakers.
3. Reports.

AREA OF STUDY: SEASHORE ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 9-12

CONCEPT: Oceans

PURPOSE: To acquaint students with the major influence of oceans in human survival; control of global weather patterns, production of oxygen supply, source of food, and current effect on climates.

ACTIVITIES: 1. Students travel to a seashore environment to study the zonation of shore and life forms. At the seashore students investigate the four zones of a seashore: dunes, upper beach, intertidal, and subtidal.

- what is the color of each zone's soil ?
- what is the texture and composition of each zone's soil ?
- what type(s) of life is to be found in each zone ?

2. The students are divided into several small work groups and are given a section of the seashore to study. They use plankton nets to collect specimens of marine life. These specimens can be studied on-site and can be taken back to the classroom for further study.

3. In the classroom -- students discuss their field trip and study specimens collected. They also are shown films, filmstrips, and slides which deal with seashores. THESE ACTIVITIES ACT AS A FOLLOW-UP TO THE FIELD TRIP.

EVALUATION: 1. Student field study activities.

2. Inclass discussions.
3. Visual displays depicting the seashore environment.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (Art, Language Arts, Science and Social Studies)

GRADE RANGE: 9-12

CONCEPT: Land Use Planning

PURPOSE: To acquaint students with the ways humans use the land.

ACTIVITIES: Using a local area as a basis of study students investigate land uses.

1. On a chalk board or on a huge sheet of newsprint, students list the current major uses of local land.

   a. production areas

   b. human settlement areas

   c. open space areas

   d. transportation areas

   e. recreational areas

   f. public service/utilities areas

2. Students tour their community to identify examples of each type of area listed in class. Students can take pictures with still/motion picture cameras or available VTR equipment. At least one example of each listed area should be examined/recorded.

3. Using aerial slide photos and 3D maps/stereoscopes, students investigate the totality of the local geographical area and develop worksheets. These worksheets would consist of proposals to improve both the present and future use of the land in the area.

EVALUATION:

1. Student classroom and field based activities.
2. Proposals for present/future land use (written and visual reports).
3. Quizzes and tests.
4. Discussions.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (Language Arts, Science and Social Studies)

GRADE RANGE: 10-12

CONCEPT: Land Use Planning

PURPOSE: To acquaint students with man's use(s) of land and his efforts to conserve/manage the land.

ACTIVITIES: Man's valued uses of land has demanded criteria to determine proper management practices for living on the land. Land is a finite resource and its worth/use must be managed.

1. Students identify several different local uses of the land (within the confines of a stated geographical region). Using maps of the local area - students identify the acreage to be studied. The land use topics might include:

   .roads/streets .building sites
   .septic systems .picnic/camping areas/recreational areas
   .farms/crop cultivation
   .pasture land .forest areas
   .wildlife areas

2. Students go out into the community to investigate, first hand, the area to be studied - and to determine its current use. Pictures may be taken and sensory data recorded.

3. Students discuss the current uses of the land; determining the advisability and feasibility of such usage. If there is a need to change local land use policy - or to develop a new land use policy - students can be involved in a policy development project.

4. Student policy recommendations are presented to the town/city fathers.

5. Community people can be interviewed by student work groups or can appear as guest speakers in classrooms to discuss their current use of the land and to propose changes.

6. Students conduct soil sample testing in the area to determine its best possible usage - as related to the several land use categories (e.g., farming, housing, sewage disposal, industry).

7. Students develop a land use slide/tape project - for use by future classes as an instructional tool.

EVALUATION:

1. Student classwork/field work projects.
2. Questions asked of guest speakers or during interviews.
3. Proposals for local land use.
4. Presentations to local town/city fathers re: land use.
5. Quizzes and tests - as well as discussions.

AREA OF STUDY: ENVIRONMENTAL AWARENESS (Art, Language Arts, Science and Social Studies)

GRADE RANGE: 9-12

CONCEPT: Land Use Planning

PURPOSE: Students learn to evaluate the compatibility of existing community land uses with natural conditions.

ACTIVITIES: 1. Using the results gained from the land use compatibility study, students investigate the compatibility of existing land uses with existing natural conditions.

a. Students develop or obtain the following types of local area maps:

.topographic .human settlement
.flood hazard area
.land suitability .sewer lines

b. The topographic map overlay is placed over the human settlement map. Students locate three slopes which are the highest and steepest (marking each with an "s").

.are any buildings found on these slopes?
.what are some of the effects of the highest and steepest areas on land use?

c. The flood hazard area map overlay is placed over the human settlement map.

.are there any buildings on the flood plain?
.what are some of the effects of flood hazard areas on land use planning?

d. The land suitability map overlay is placed over the human settlement map.

.are there any buildings located on land best suited for agriculture? Is this good or bad?
.are there any buildings located on soils best suited for forest and wildlife? Is this good or bad?

e. The sewer lines map overlay is placed over the human settlement and land suitability maps.

.where do the sewer lines empty?
.does the sewage system effect water supplies?
.are leeching fields used? If so, where are they located?

2. After completing the local area map study students discuss their findings and prepare reports.

3. Student groups can be assigned to different land use topics (e.g., human settlement, flood plain, sewage system) and can develop reports comparing the <u>what is</u> with the <u>what could/should be</u>.

4. In preparation for reports development - students take field trips to local sites to see how the land is being used; the pros and cons of the issues.

<u>EVALUATION</u>: 1. Student map activities and findings.

2. Field activities.

3. Reports.

4. Quizzes and tests - as well as discussions in-class and/or in the field.

AREA OF STUDY: SEASHORE ENVIRONMENTS (art, language arts, and science) GRADE RANGE: 9-12

CONCEPT: Oceans

PURPOSE: To acquaint students with the major influence of oceans in human survival; control of global weather patterns, production of oxygen supply, source of food, and current effect on climates.

ACTIVITIES:

1. Films, filmstrips, and slides are used to introduce students to the topic of study: ocean ecosystem producers and consumers.
2. Guest speakers discuss the seashore environment and its producers/ consumers.
3. Students research and discuss the topic prior to a field trip to a seashore environment. STUDENT REPORTS CAN BE DEVELOPED FOR CLASS PRESENTATION.
4. Students are taken on a field trip to a seashore environment to study ecosystem producers and consumers. FILMS, SLIDES, OR VIDEO TAPES CAN BE MADE FOR FUTURE USE BY THE CLASS OR OTHER CLASSES UNABLE TO TAKE A FIELD TRIP TO A SEASHORE SITE.
5. Students search for: phytoplankton, zooplankton, sponges, colentrates, echinoderm, molusk, crustaceans, and fish. SAMPLES MAY BE TAKEN FOR LATER CLASSROOM STUDY.

EVALUATION:

1. Student activities.
2. Questions asked guest speakers.
3. Reports.
4. Teacher-made quizzes and tests.

AREA OF STUDY: OCEANOGRAPHY (Language Arts, Science and Social Studies)

GRADE RANGE: 10-12

CONCEPT: The World's Oceans

PURPOSE: To acquaint students with the distribution of land and water on the Earth's surface.

ACTIVITIES:

1. Acquaint students with the world's oceans and their geographical position(s) on the Earth's surface. Students, working alone or in groups, use globes and maps to locate different oceans - by name.
2. Using globes and maps, students label continents, oceans and principle seas of the world.
3. In each ocean area, students list at least three major nations to be found in the area(s).
4. Students research both the historical development of the several oceans and also identify historical events on - or near each ocean. Students develop chronological time lines.

EVALUATION:

1. Student activities and projects.
2. Written/oral reports.
3. Discussions.

CLASS ACTIVITY I: Estimating the percent of the earth's surface covered by oceans.

NAME: _____ DATE: _____

_____ SCORE: _____

MATERIALS NEEDED: 2 copies of the world map
1 ruler
1 pencil

DIRECTIONS: Your object in this exercise is to come up with an accurate estimation of the percent of the earth's surface covered by ocean water. You may use a ruler, the map and a pencil, but no other aids, except your own thinking power.

DATA: Amount of surface covered by land: _____

Amount of surface covered by oceans: _____

Total amount of surface: _____

Percent of surface covered by oceans = $\frac{\text{Amount covered by oceans}}{\text{Total amount of surface}}$ X 100%

(use the above equation to find the percent coverage)